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of the

UNITED STATES PATENT OFFICE

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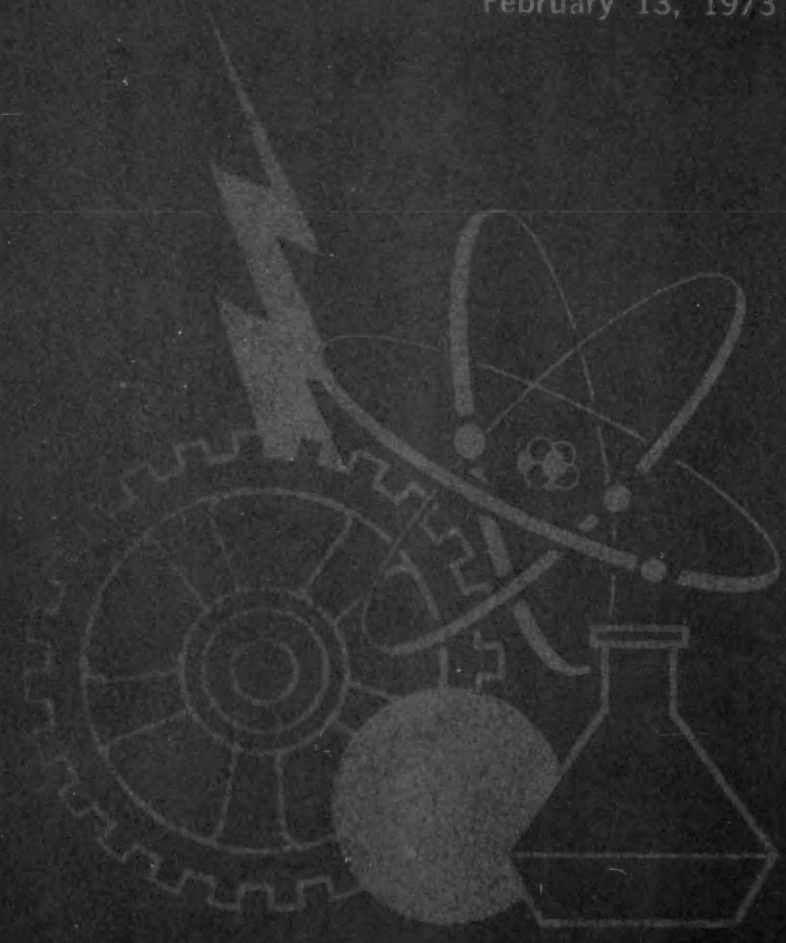
PATENTS

February 13, 1973



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 13, 1973 Volume 907 Number 2

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PATENT OFFICE NOTICES

Meeting of the Public Advisory Committee for Trademark Affairs

The Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce to advise the Patent Office of the Department of Commerce on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government in the trademark field.

The next meeting of the committee will be held on February 22nd and 23rd, 1973, at the Cherry Hill Inn, Cherry Hill, New Jersey, beginning at 9:00 a.m. each day in the Currier and Ives Room.

The following agenda is to be considered:

1. Review of pending Advisory Committee projects;
2. Report and discussion of the implementation of previous Advisory Committee recommendations of a recently completed study relating to trademark application processing and record keeping;
3. Report and discussion of the status of the Trademark Operations;
4. Discussion of the use of forms in the Trademark Operations; and
5. Discussion of working hours in the Trademark Operations.

The membership of the Advisory Committee consists of nine members of the Patent Office-Trademark Affairs Committee of the United States Trademark Association.

Meetings of the Advisory Committee are open to the public. Public attendance depending on available space, may be limited to those persons who have notified the Advisory Committee Management Officer in writing, at least five days prior to the meeting, of their intentions to attend the February 22–23 meeting.

Any member of the public may file a written statement with the Committee before, during, or after the meeting, and to the extent that time for the meeting permits the Committee Chairman may allow public presentation of oral statements at the meeting.

All communications regarding this Advisory Committee should be addressed to Mr. Rene D. Tegtmeyer, Advisory Committee Management Officer for Trademark Affairs, Room 3–11D27, U.S. Patent Office, Washington, D.C. 20231.

ROBERT GOTTSCHALK,
Jan. 16, 1973. *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,690,610, Begle and Gaudreau, MILLING CUTTER; **3,273,222,** J. H. Begle, CUTTING TOOL AND METHOD; **3,487,535,** same, METHOD OF ASSEMBLING AND MAINTAINING CUTTING TOOL, filed Aug. 16, 1972, D.C., E.D. Mich. (Detroit), Doc. 38759, *Kysor Industrial Corp.* v. *Supreme Tri-Bit Co.*

2,880,309, Gallagher and Pelino, HOT-BOX DETECTOR, filed May 7, 1959, D.C., S.D.N.Y., Doc. C–146–39, *Barnes Engineering Company* v. *Servo Corp. of America.* Filed order of discontinuance, Aug. 17, 1972.

2,954,621, Mosher, Goldammer and Long, ADJUSTABLE BRACELET FOR IDENTIFICATION PURPOSES; **3,059,359,** same, BRACELET FOR IDENTIFICATION PURPOSES, filed Aug. 21, 1972, D.C., M.D. Tenn. (Nashville), Doc. C–6704, *Precision Dynamics Corporation* v. *Robert Englert, individually and doing business as Englert Sales Co.*

3,059,359. (See 2,954,621.)

3,166,112, M. Fisher, TOILET TANK COVER SET, filed Aug. 12, 1968, D.C., S.D.N.Y., Doc. 68–C–3249, *Perfect Mfg., Inc.* v. *Glen Mfg., Inc.* Stipulation and order of discontinuance pursuant to Rule 41a. Aug. 14, 1972.

3,185,207, D. R. Humble, DECORATION STRUCTURE, filed Aug. 16, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1901–AAH, *Soundfold, Inc.* v. *Eastern Carpet Co., Inc.*

3,202,299, M. A. Decuir, MOBILE GUY DERRICK AND COUNTER BALANCING CRANE, filed Aug. 23, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72–C–474, *American Hoist & Derrick Co.* v. *T. S. DeCuir.*

3,211,335, J. J. Shapiro, LIQUID DISPENSING DEVICE, filed Aug. 15, 1972, D.C., N.D. Calif. (San Francisco), Doc. 72–1482ACW, *Labindustries* v. *L.S.T. Electronics, Inc.*

3,236,390, H. F. J. Sprengel, SHIP'S CARGO BOOM WITH PENDULUM PURCHASE BLOCK FITTING, filed Aug. 16, 1972, D.C., E.D. Pa. (Philadelphia), Doc. 72–1625, *Blohm & Voss AG and MacGregor-Comarain, Inc.* v. *Sun Shipbuilding and Dry Dock Company.*

3,273,222. (See 2,690,610.)

3,296,147, E. M. Gatza, CLEANER FOR FOOD RESIDUES, filed June 19, 1967, D.C., S.D. Ga. (Atlanta), Doc. 11026, *The Dow Chemical Company* v. *Jack Ferrell, individually and doing business as J. & D. Landfill Company, J. P. Bone, individually and doing business as Bone Sales Company, Ed Hill and Gene Forsyth.* Decision that defendant Donald Manning surrender to counsel for plaintiff all "Blue Label" Dow Oven Cleaner now in his possession for destruction by plaintiff enjoined defendant, Aug. 20, 1969.

3,315,320, Bass and Horvat, PNEUMATIC CLEANING MEANS FOR CARDING MACHINES, filed Aug. 15, 1972, D.C., W.D.N.C. (Charlotte), Doc. C–C–72–180, *Jenkins Metal Shops, Inc.* v. *Pneumafil Corporation.*

3,315,339, D. W. Young, TOOL FOR MOUNTING OR DEMOUNTING AUTOMOTIVE VALVE ASSEMBLIES, filed Aug. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–871, *David M. Young* v. *Joseph J. Sosnoski et al.*

3,319,384, E. T. Berg, CONSTRUCTION FOR EXTRUDED REGLETS, filed Aug. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–874, *Edward T. Gery and Superior Concrete Accessories, Inc.* v. *Vari-Seal Corporation.*

3,376,388, M. C. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS; **3,495,181(a),** same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, filed July 24, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1812, *Martin G. Reiffin* v. *Heathkit Electronic Center, Heath Co. & Schlumberger Limited.* Cause dismissed by notice of voluntary dismissal under Rule 41(a) filed by plaintiff, Aug. 2, 1972.

3,400,461, T. L. Faul, CARRIAGE-TYPE DRAWING APPARATUS, filed Aug. 16, 1972, D.C., S.D.N.Y., Doc. 72–C–3494, *Firma Albert Nestler, Ag.* v. *Keuffel & Esser Co.*

3,487,535. (See 2,690,610.)

3,488,868, Gutowski, Kuchta and West, MEASURING TOOL; **D. 213,643,** same, MEASURING TOOL FOR CARPENTRY AND THE LIKE, filed May 4, 1972, D.C., E.D.N.Y. (Brooklyn), Doc. 72C438, *Stanley Works* v. *Oswall Tool Co., Ltd.* Consent judgment, Aug. 17, 1972.

3,495,181(a). (See 3,376,388.)

3,495,181(b), M. G. Reiffin, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, filed July 26, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1843, *Martin G. Reiffin* v. *Heath Company et al.*

3,496,911, A. Chmelar, ELECTROSTATIC FLOCKING; **3,551,178,** same, METHOD AND APPARATUS FOR ELECTROSTATIC FLOCKING, filed Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16204, *Velvetex Industrial Corporation* v. *Evershine Products, Inc.* Same, filed Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16205, *Velvetex Industrial Corporation* v. *Universal Textures, Inc.*

3,510,004, J. Hoeltzenbein, ARTIFICIAL KIDNEY, filed Aug. 17, 1972, D.C. Del. (Wilmington), Doc. 4450, *Extracorporeal Medical Specialties, Inc.* v. *Baxter Laboratories Inc.*

3,551,178. (See 3,496,911.)

3,632,879(a), R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, filed Mar. 3, 1972. D.C., E.D.N.Y. (Brooklyn), Doc. 72C404, *Napco Security Systems, Inc.* v. *Atlantic Metal Products, Inc.* Case transferred to the District Court of the District of New Jersey.

3,632,879(b), R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, filed Aug. 15, 1972, D.C.N.J. (Newark), Doc. 1399-72, *Napco Security Systems, Inc.* v. *Atlantic Metal Products, Inc.*

D. 213,643. (See 3,488,868.)

Patents Available for Licensing or Sale

3,325,420. TRITIUM - ACTIVATED LUMINOUS PIGMENTS. Karl Schempp, Stuttgart, Germany. Correspondence to: M. S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,465,373. HOSPITAL BED. Harriet A. Wilson, 115 Hilltop Road, Waverly, Pa., 18471.

3,526,202. EMERGENCY SIGNAL ASSEMBLY. Hubert & Peter Graulich, 6801 Brighton Place, Coral Gables, Fla., 33133.

3,662,993. PROTECTIVE GUARD FIXTURE. Anthony Lionetto, 19 Hillcrest Ave., Fort Lee, N.J., 07024.

3,670,366. AUTOMATIC STRIPPING MACHINE FOR ABACA AND ALLIED FIBER BEARING PLANTS. Juan T. Villanueva et al., Philippines. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,692,265. CORNER MOUNTABLE BRACKETS. Forrest C. Barriger, P.O. Box 2626, Fresno, Calif., 93745.

3,697,198. ATTACHMENT FOR CHARCOAL BURNING UNIT. David A. Holder, Jr., 8303 Donoghue Drive, Hyattsville, Md., 20784.

3,698,719. RING PUZZLE WITH QUICK RESTORATION MEANS. Louis M. Winslow, Rural Route 2, Belle Plane, Iowa, 52208.

Hazeltine Research, Inc., offers to grant non-exclusive licenses on reasonable terms and conditions under the following patent.

Inquiries and requests for licenses should be addressed to: Hazeltine Research, Inc., 5445 West Diversey Ave., Chicago, Ill., 60639. Attention: Mr. S. P. Ronzheimer, President.

3,316,349. IMAGE ORTHICON BEAM CONTROL SYSTEM FOR AUTOMATICALLY OPTIMIZING SIGNAL-TO-NOISE RATIO OF THE VIDEO OUTPUT.

General Motors Corporation is prepared to grant non-exclusive license under the following patent upon reasonable terms.

Applications for license may be addressed to the: Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,535,585. SAFETY LAMP CIRCUIT FOR SERIALLY CONNECTED VEHICLE LAMPS.

The General Tire & Rubber Company is prepared to grant non-exclusive licenses at reasonable royalty rates under the following patent.

Inquiries respecting licenses should be addressed to: General Tire & Rubber Co., 1 General St., Akron, Ohio, 44309.

3,574,149. FLAME RETARDANT FLEXIBLE POLYURETHANE FOAMS.

Eastman Kodak Company announces that, in accordance with its policy, nonexclusive licenses upon reasonable terms are available to responsible applicants under the following U.S. Patent.

This offer is consistent with the present practice of Eastman Kodak Company generally to grant nonexclusive licenses under unexpired U.S. patents on photographic inventions issued to Kodak prior to 1968 and on inventions made in the course of research or development work for the U.S. Government.

Inquiries regarding the availability of such licenses may be addressed to Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,295,428. PHOTOGRAPHIC APERTURE REGULATING DEVICE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 29 patents.

Inquiries respecting licenses should be addressed to: RCA Corportion, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,702,446. VOLTAGE-CONTROLLED OSCILLATOR USING COMPLEMENTARY SYMMETRY MOSFET DEVICES.

3,702,725. DECODING OF COLOR-ENCODED PHASE GRATING.

3,702,786. MOS TRANSISTOR WITH ALUMINUM OXIDE GATE DIELECTRIC.

3,702,941. ZERO CROSSING POINT SWITCHING CIRCUIT.

3,702,943. FIELD-EFFECT TRANSISTOR CIRCUIT FOR DETECTING CHANGES IN VOLTAGE LEVEL.

3,702,971. BROADBAND MICROWAVE APPARATUS USING MULTIPLE AVALANCHE DIODES OPERATING IN THE ANOMALOUS MODE.

3,702,990. VARIABLE THRESHOLD MEMORY SYSTEM USING MINIMUM AMPLITUDE SIGNALS.

3,703,329. LIQUID CRYSTAL COLOR DISPLAY.

3,703,331. LIQUID CRYSTAL DISPLAY ELEMENT HAVING STORAGE.

3,703,332. LIGHT MODULATOR AND DISPLAY DEVICE.

3,703,401. METHOD FOR PREPARING THE VIEWING-SCREEN STRUCTURE OF A CATHODE-RAY TUBE.

3,703,407. RELIEF PHASE HOLOGRAMS.

3,703,667. SHAPED RISER ON SUBSTRATE STEP FOR PROMOTING METAL FILM CONTINUITY.

3,704,207. PROCESS FOR FORMING AN ISOLATED CIRCUIT PATTERN ON A CONDUCTIVE SUBSTRATE.

3,704,208. PROCESS FOR FORMING A CONDUCTIVE COATING ON A SUBSTRATE.

3,704,936. ACHROMATIC DEPTH-OF-FIELD CORRECTION FOR OFF-AXIS OPTICAL SYSTEM.

3,705,323. CATHODOCHROMIC SODALITE AND CATHODE RAY TUBE EMPLOYING SAME.

3,705,355. WIDE DYNAMIC RANGE PRODUCT DETECTOR.

3,706,014. SEMICONDUCTOR DEVICE.

3,706,016. MOTOR CONTROL CIRCUIT.

3,706,132. MAGNETIC TRANSDUCER FABRICATION TECHNIQUE.

3,706,558. PHOTOGRAPHIC METHOD FOR PRINTING VIEWING SCREEN STRUCTURE INCLUDING TREATMENT OF EXPOSED COATING BEFORE DEVELOPMENT.

3,706,845. METHOD OF IMPROVING THE GAMMA OF A CATHODOCHROMIC DISPLAY DEVICE.

3,706,861. APPARATUS FOR MOUNTING AND SPACING A SIGNAL TRANSDUCER WITH RESPECT TO A RECORDING MEDIUM.

3,706,880. MULTIPLE-PHASE LOGIC CIRCUITS.

3,707,254. AERIAL PHOTOGRAPHY.

3,707,597. VIDEO BLANKING AND AUDIO MUTING CIRCUIT.

3,707,603. FM STEREOPHONIC RECEIVER DETECTION APPARATUS AND DISABLING MEANS.

3,707,723. LIGHT BEAM SCANNING.

General Electric Company is prepared to grant non-exclusive licenses under the following 47 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: General Electric Co., Division Patent Counsel, Housewares Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,656,018. BRUSH HOLDER ASSEMBLY.

3,673,054. LAMINATED STRUCTURES AND METHOD.

Applications for license under the following 14 patents may be addressed to: Patent Counsel, Lamp Business Division, General Electric Co., Nela Park, Cleveland, Ohio, 44112.

3,191,406. PHOTOFLASH LAMP.

3,384,453. PROCESS FOR PREPARING HIGHLY CRYSTALLINE ALPHA STRONTIUM ACID PHOSPHATE.

3,385,656. METHOD OF PURIFYING ZINC AND CADMIUM CHALCOGENIDES.

3,416,019. ZINC SILICATE PHOSPHOR OF IMPROVED MAINTENANCE.

3,424,605. LAMP PHOSPHOR ADHERENCE.

3,424,606. LAMP PHOSPHOR ADHERENCE.

3,475,072. GETTER FOR INCANDESCENT LAMPS AND SIMILAR DEVICES.

3,475,342. RARE-EARTH OXIDE PHOSPHORS ACTIVATED WITH BISMUTH.

3,484,383. EUROPIUM-ACTIVATED STRONTIUM MAGNESIUM PYROPHOSPHATE PHOSPHORS.

3,506,385. PHOTOFLASH LAMP.

3,532,931. PHOTOFLASH ASSEMBLY FOR SEQUENTIALLY FLASHING LAMPS UTILIZING VOLTAGE AND CURRENT RESPONSIVE DEVICES.

3,535,267. ZINC ORTHOSILICATE PHOSPHOR OF IMPROVED MAINTENANCE AND ITS MANUFACTURE.

3,546,128. LANTHANUM AND GADOLINIUM OXYBROMIDE LUMINESCENT MATERIALS ACTIVATED WITH ERBIUM.

3,658,715. ANTIMONY-ACTIVATED CALCIUM HALOPHOSPHATE CONTAINING BORON.

Applications for license under the following 30 patents may be addressed to: General Electric Co., Building 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

2,847,541. DOUBLE BREAK LIQUID BLAST CONTACTOR.

2,942,216. ELECTRICAL APPARATUS AND ENCLOSURE THEREFOR.

2,958,016. IMPULSE GENERATING DEVICE FOR A WATTHOUR METER.

3,030,551. ELECTRICAL APPARATUS.

3,039,176. AUTOMATIC WORK PERFORMING METHOD & APPARATUS.

3,073,722. PROCESS FOR COATING FERROUS MATERIAL AND MATERIAL COATED BY SUCH PROCESS.

3,113,375. MECHANISM FOR SPACING SEPARATED LAMINATIONS OF A CUT CORE.

3,118,220. MECHANISM FOR SEPARATING CORE LAMINATIONS.

3,137,190. MAGNETIC PULL UP MACHINE FOR POSITIONING AND LINEAL MEASUREMENT OF MAGNETIC STRIP MATERIAL.

3,154,734. ELECTRICAL MASTER-SLAVE TAP CHANGING SYSTEM.

3,206,569. PROTECTIVE MEANS FOR TRANSFORMER TAP CHANGER.

3,206,580. FLUID IMMERSED TAP CHANGING SWITCHING SYSTEM FOR TRANSFORMERS.

3,211,576. PROCESS FOR COATING FERROUS MATERIAL AND MATERIAL COATED BY SUCH PROCESS.

3,211,577. PROCESS FOR COATING FERROUS MATERIAL WITH MAGNESIUM OXIDE.

3,213,223. INTERLOCKING MEANS FOR SERIES-MULTIPLE SWITCH AND TAP CHANGER IN DUAL RATED TRANSFORMER.

3,302,005. IMPULSE TOTALIZER USING SOLID STATE COMPONENTS.

3,327,373. METHOD OF MAKING PRE-FORMED SINGLE TURN MAGNETIC CORES.

3,344,229. CASING SEAL FOR BUS BARS.

3,348,067. SOLID STATE IMPULSE GENERATOR USING SILICON CONTROLLED RECTIFIERS FOR SWITCHING.

3,427,469. TIME DELAY CIRCUIT FOR REGULATOR CONTROL CIRCUIT.

3,482,198. PHOTOSENSITIVE DEVICE.

3,489,019. HERMETIC SEAL AND SHAFT ASSEMBLY.

3,489,924. PULSE COUNTER DRIVING CIRCUIT.

3,493,952. ELECTRIC CIRCUIT BREAKER W/CONTACT CONDITION INDICATOR.

3,518,544. FAULT DETECTION CIRCUIT FOR SHIELDED CABLE TERMINATION.

3,524,133. STATIC STATE VOLTAGE & CURRENT MONITORING DEVICE FOR ELECTRIC POWER CABLE TERMINATIONS.

3,530,723. METER HAVING METER COVER LINER.

3,532,963. COMPENSATING MEANS FOR UNBALANCE IN CASCADE TYPE INSTRUMENT POTENTIAL TRANSFORMERS.

3,532,964. LOAD COMPENSATED INSTRUMENT POTENTIAL TRANSFORMER OF IMPROVED ACCURACY.

3,699,491. FUSE HAVING VIBRATION DAMPING MEANS FOR PROTECTING THE FUSE LINK THEREOF.

Certificates of Correction for the Week of Feb. 13, 1973

3,503,446	3,685,268	3,690,917	3,694,246
3,566,352	3,685,279	3,690,941	3,694,298
3,578,511	3,685,401	3,691,017	3,694,382
3,586,768	3,685,867	3,691,107	3,694,410
3,608,117	3,686,020	3,691,145	3,694,562
3,609,120	3,686,117	3,691,320	3,694,658
3,624,122	3,687,046	3,691,330	3,694,770
3,624,546	3,687,311	3,691,832	3,694,812
3,629,618	3,687,461	3,692,074	3,694,844
3,639,859	3,687,521	3,692,098	3,694,865
3,647,836	3,687,639	3,692,146	3,694,891
3,649,059	3,687,663	3,692,255	3,694,979
3,655,071	3,687,963	3,692,276	3,695,072
3,658,807	3,688,007	3,692,350	3,695,124
3,663,635	3,688,016	3,692,617	3,695,137
3,666,198	3,688,134	3,692,847	3,695,139
3,673,180	3,688,154	3,692,850	3,695,198
3,674,526	3,688,202	3,692,880	3,695,225
3,678,403	3,688,302	3,693,017	3,695,487
3,678,405	3,688,497	3,693,079	3,695,516
3,678,605	3,688,553	3,693,124	3,695,698
3,679,664	3,688,966	3,693,484	3,695,745
3,680,390	3,689,148	3,693,530	3,696,488
3,681,125	3,689,289	3,693,532	3,696,507
3,682,238	3,689,637	3,693,652	3,696,518
3,682,377	3,689,654	3,693,685	3,696,639
3,682,585	3,689,955	3,693,707	3,697,086
3,682,794	3,690,096	3,693,715	3,697,151
3,683,781	3,690,398	3,693,818	3,697,237
3,683,973	3,690,422	3,693,950	3,697,348
3,684,297	3,690,576	3,693,969	3,697,761
3,684,329	3,690,577	3,693,996	3,697,925
3,684,436	3,690,824	3,694,053	3,698,225
3,684,888	3,690,851	3,694,145	3,698,305

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 23, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-10-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-31-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-21-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-26-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators, Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during February 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents..... Number 1,456

PLANT PATENTS

GRANTED FEBRUARY 13, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,302
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Apr. 15, 1971, Ser. No. 134,514
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—27 **1 Claim**

A floribunda rose of spreading and vigorous bushy growth, abundantly covered with medium-sized somewhat leathery and semi-glossy leaves, having peduncles of short to average length which are smooth except for numerous stipitate glands, the flower of said floribunda rose being characterized in that even from the opening of the bud the petals have pronounced apexes that are from acute to acuminate, seen especially on the outside and intermediate petals. The petalage of the freshly opened flower is double, comprising up to 45 petals and 10 to 14 petaloids in a bloom measuring more than 3 inches but less than 4 inches in diameter. The coloration of the flower is predominantly medium salmon-pink.

3,303
ROSE PLANT
David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.
Filed Apr. 15, 1971, Ser. No. 134,515
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—21 **1 Claim**

A new variety of rose plant of the hybrid tea class, particularly vigorous, tall growing and much branched, with long stems and generally smooth peduncles sometimes offset at an angle at the point of attachment to the stem, each stem generally bearing a single flower, but sometimes carrying an irregular cluster of three to four or more. Foliaceous appendages extend beyond the tip of the bud before the calyx breaks to a distance almost equal to the length of the bud. The flowers are dark red in color, with as many as forty-five petals and sixteen petaloids, the bloom being up to six inches in diameter when fully open. Flower petals are medium thick, moderately leathery, and, on exposure to sun, do not show black spots which sun burn often produces on the outer petals of roses which are deep red in color. Flowers on the bush persist for four to five days in the garden and from five to seven days as cut blooms at living-room temperature, in the month of November, in Ontario, Calif.

3,304
SPUR-TYPE SOUR CHERRY TREE
Francis Warren Carnefix, Fruitland, Idaho 83619
Filed Apr. 19, 1971, Ser. No. 135,323
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—37 **1 Claim**

A spur-type sour cherry tree is disclosed constituting a mutation of the standard Montmorency.

3,305
CARNATION
Vincent P. Quinn, 1235 S. Irving St., Denver, Colo. 80219
Filed June 21, 1971, Ser. No. 155,366
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein described and illustrated.

PATENTS

GRANTED FEBRUARY 13, 1973

GENERAL AND MECHANICAL

3,715,763
ARTIFICIAL LIMB FOR THE KNEE JOINT
Waldemar Link, 13 Fuhlsbuttler Str. 402-404, Hamburg, Germany
Filed April 21, 1971, Ser. No. 136,082
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **3 Claims**

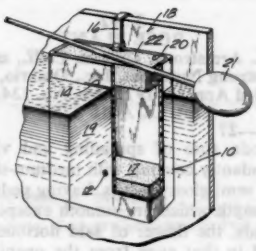
An artificial limb particularly suitable for the knee joint of a human being consisting of at least two coacting inserts or implants, which are anchored to the end of the thigh bone and the shin bone. The insert on the thigh bone is a cup-shaped surface and the insert on the shin bone is formed like a block to provide a free supporting face for contact by the surface of the cup-shaped insert.

3,715,764
HIGH POROSITY MANGANESE OXIDE PELLETS
Vincent H. K. Chu, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Continuation-in-part of Ser. No. 871,599, Nov. 3, 1969, abandoned, which is a continuation of Ser. No. 642,182, May 29, 1967, abandoned. This application May 13, 1971, Ser. No. 143,201
Int. Cl. C01g *45/02*; B01j *11/06*
U.S. Cl. 423—49 **4 Claims**

Porous manganese oxide pellets in which a major portion of the manganese oxides is manganous oxide and the porosity of the pellets is not less than about 45%. Preferably, substantially all the manganese oxide in the pellets is manganous oxide and the porosity is about 60 percent. The porous manganese oxide pellets are between about one-fourth inch to about five-eighths inch in diameter. The pellets are useful as sulfur acceptors whereby they can be used to reduce the sulfur content of other materials such as coke pellets, iron ore pellets and the like.

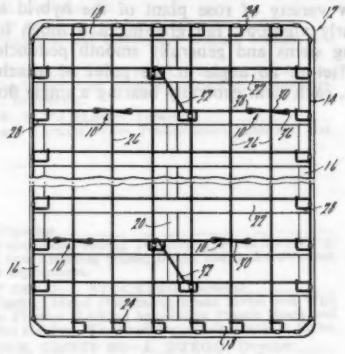
3,715,765
DEODORIZER
Frank G. Yadro, 7807 North 45th Street, Milwaukee, Wis.
Filed Nov. 4, 1970, Ser. No. 86,884
Int. Cl. E03d *9/02*
U.S. Cl. 4—228 **4 Claims**

Deodorant or perfume is dispensed from an absorbent material whenever a water closet is flushed. The absorbent material is over an air opening in a chamber which is filled with water after the water closet is flushed so that air is expelled through the absorbent material containing deodorant or the like and a small quantity is carried into the room air. The absorbent material may form the top of a chamber normally containing air and water or may be supported on a tray



which forms the top. In some embodiments, the absorbent material is initially sealed with or enclosed by water soluble materials.

3,715,766
CONNECTOR AND STIFFENER MEMBER FOR INTERSECTING WIRES
Walter V. Slominski, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Sept. 18, 1970, Ser. No. 73,299
Int. Cl. A47c *23/02*
U.S. Cl. 5—247 **9 Claims**



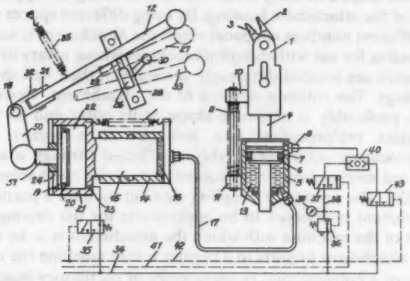
A connector and stiffener member for upper and lower intersecting wires consisting of a length of wire engaged intermediate its ends with the lower one of the intersecting wires substantially at the intersection of the upper and lower wires and having its ends hooked over the upper one of the intersecting wires at positions on opposite sides of the intersection. The connector and stiffener member is stressed so that the hook shape end portions apply downward forces to the upper one of the intersecting wires and an intermediate portion of the connector and stiffener member applies an upward force to the lower one of the intersecting wires at the intersection.

3,715,767

CONTROL MECHANISM FOR SHOE LASTING PINCERS

Anton Muhlbach, Frankfurt am Main-Sossenheim, and Rudi Fichtner, Ober Horgern, Germany, assignors to USM Corporation, Flemington, N.J.

Filed Apr. 29, 1971, Ser. No. 138,544
Claims priority, application Germany, Apr. 30, 1970, P 20 21 352.9
Int. Cl. A43d *23/00*
U.S. Cl. 12—14.5 **5 Claims**



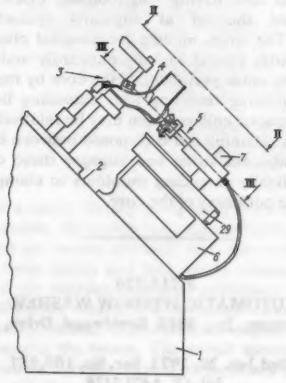
A gripper actuating mechanism for shoe lasting machines including grippers movable to tension a shoe upper about a last, an adjusting lever connected through fluid means to follow the movement of the grippers and engageable with a stop to limit the gripper movement, said lever being disengageable from the stop so that movement of the lever causes an adjusting movement of the gripper.

3,715,768

SUPPORT FOR A SHOE LASTING MACHINE

Gerhard Giebel, Neuenhain, Taunus, and Rudi Fichtner, Butzbach, Hessen, Germany, assignors to USM Corporation, Flemington, N.J.

Filed Sept. 8, 1971, Ser. No. 178,766
Claims priority, application Germany, Sept. 8, 1970, P 20 44 385.0
Int. Cl. A44d *3/00*
U.S. Cl. 12—125 **3 Claims**



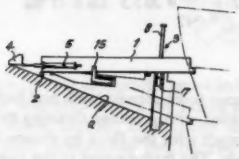
A support engageable with the heel end of a shoe for support against lasting means, the support, on retraction, being moved bodily widthwise to permit the shoe to drop into a receptacle, and also being swung toward the shoe to deflect the shoe into the receptacle.

3,715,769

SLIDABLE MOBILE BRIDGE

Kunio Mori, Shinagawa-ku, Tokyo, and Yoshio Shirage, Fujisawa-shi, Kanagawa-ken, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 74,070
Claims priority, application Japan, Dec. 28, 1969, 44/105078
Int. Cl. E01d *15/10*
U.S. Cl. 14—71 **8 Claims**



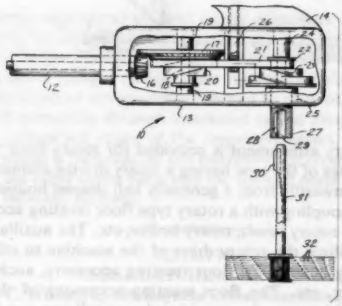
A shiftable mobile bridge for use between a quay and a ship in which a rotatable roller is attached to an end of the main bridge gangway adjacent the quay. The roller can be moved horizontally or vertically by appropriate hydraulic or gravity devices, along an inclined quay face as the main bridge gangway is moved inwardly and outwardly from the quay in a generally horizontal direction. The outboard end of the gangway can also be moved vertically to accommodate differences in level between ship and shore.

3,715,770

WASHING APPARATUS

Carlos F. Obregon-Gomez, 4231 S.W. 58th Ave., Miami, Fla.

Filed March 22, 1971, Ser. No. 126,655
Int. Cl. A46b *13/02*
U.S. Cl. 15—23 **2 Claims**



A device for washing pots and pands and the like. The device includes a motor having a flexible cable for powering, mechanically, a handheld unit which receives various rotatable brushes.

3,715,771

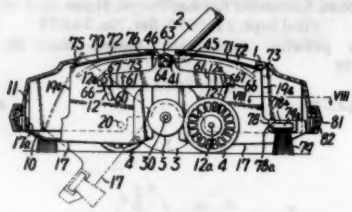
CARPET SWEEPER WITH SWING COMB

Hiroshi Fukuba, 2-32-82 Matsugaoka, Nagareyama, Japan

Division of Ser. No. 823,570, May 12, 1969. This application March 4, 1971, Ser. No. 121,011

Int. Cl. A47l *11/33*

U.S. Cl. 15—48 **2 Claims**



A carpet sweeper to be moved back and forth by operating a handle is provided with a rotary cleaning brush adapted to be moved in contact with the floor by means of drive wheels on a sweeper body. The frame cover of the sweeper body is of a double wall structure made of a thin, lightweight synthetic resin plate. The sweeper body further comprises dust receptacles covering the under portion and positioned to the front and rear of the rotary brush, means for elevating the drive wheels and comb members to clean the rotary brush. The operating members for opening or closing the dust receptacles and for elevating means are disposed on the upper surface of the frame cover.

3,715,772

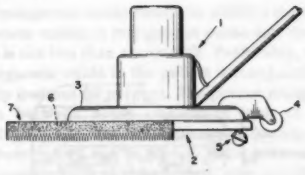
RECIPROCATING CORNER AND BASEBOARD CLEANING AUXILIARY ATTACHMENT FOR ROTARY FLOOR TREATMENT MACHINES

Gertrude E. Downing, 1531 K Street, S.E., Washington, D.C., and William P. Desjardin, 5549 Gary Avenue, Alexandria, Va.

Filed Aug. 31, 1971, Ser. No. 176,663

Int. Cl. A47l *11/12*

U.S. Cl. 15—49 RB **12 Claims**



An auxiliary attachment is provided for rotary floor treatment machines of the type having a rotary driving element extending downwardly from a generally bell shaped housing for detachable coupling with a rotary type floor treating accessory, such as a rotary brush, rotary buffer, etc. The auxiliary attachment utilizes the rotary drive of the machine to effect a reciprocating action of a floor treating accessory, such as a brush, buffer, etc. The floor treating accessory of the attachment, which may be considered generally as a rubbing element, reciprocates in guides provided in the housing of the attachment. The rubbing element extends beyond the limits of the attachment housing, and preferably includes rubbing surfaces on its upright sides, such that it can also clean baseboards. The drive assembly for the attachment is journaled in the top surface of the attachment housing, and includes at its upper end an appropriate but conventional coupling member which is adapted to detachably couple with the rotary driving element of the machine. When coupled to a machine, the lower edge of the bell shaped housing of the machine abuts against the upper surface of the attachment housing, which preferably is provided with a rubber-like mat. The auxiliary attachment is adaptable for use with different models of rotary machines through the provision of spacer rings or the like for locating the coupling member of the attachment above the top surface of the attachment such that the coupling member will readily mate with and couple to the rotary drive element of the machine, with the lower edge of the bell shaped housing of the machine abutting the upper surface of the attachment housing. By using different spacer rings or different numbers of spacer rings, the attachment is readily adaptable for use with different machines whose rotary driving elements are located differently vertically in their bell shaped housings. The rubbing element of the attachment, viewed in plan, preferably is of wedge shape at its outer end so as to facilitate reciprocation into and out of a corner. The reciprocatory action preferably is effected through a crank and rod mechanism, or an eccentric and rod mechanism, or the like. The particular coupling element used on a particular attachment is selected to be appropriate for the driving element of the machine with which the attachment is to be used. The attachment imparts to a regular rotary machine the capability of a conventional reciprocatory or oscillatory machine, while avoiding the expense of two completely separate machines.

3,715,773

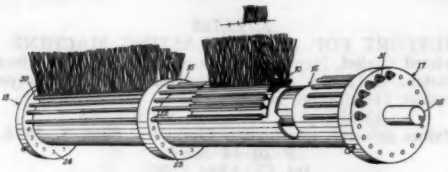
ROTARY SWEEPER BRUSH

Arthur E. Drumm, Route 1, Marysville, Ohio

Filed April 7, 1971, Ser. No. 132,086

Int. Cl. A46b

U.S. Cl. 15—183 **4 Claims**



A rotary sweeper brush of the heavy duty type which comprises a central core having longitudinally extending bristle strips mounted thereon at angularly spaced internals therearound. The strips include longitudinal channels from which the bristles extend radially outwardly and which are held against the outer periphery of the core by means of longitudinally extending retaining rods extending between opposed axially spaced collars which may be relatively rotatable on the core. A retaining rod is disposed between each pair of channels of adjacent strips and engages these channels at outer longitudinally extending shoulders to clamp the channels against the periphery of the core.

3,715,774

AUTOMATIC WINDOW WASHER

Robert D. Fannon, Jr., 3818 Braidwood Drive, Columbus, Ohio

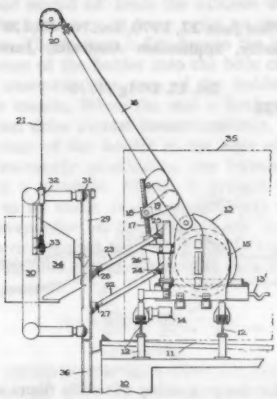
Filed Jan. 20, 1971, Ser. No. 107,957

Int. Cl. A47l *5/38*

U.S. Cl. 15—302 **17 Claims**

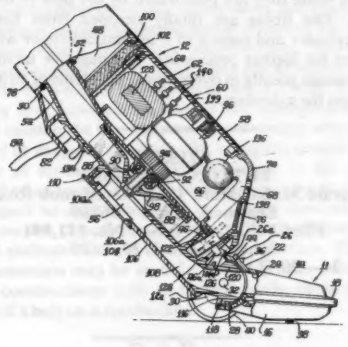
An automatic window washer has a module riding in tracks on the face of the building and is controlled from a unit mounted on the roof of the building. As the module moves

down the face of the building the presence of areas to be washed is automatically sensed and the washing operations then automatically begun and terminated by equipment in the module. The module or modules may be mounted in a span frame for lateral movement therein for washing more than one



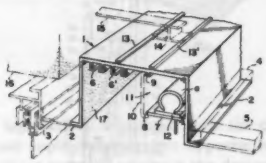
vertical column of windows when the tracks on the face of the building are spaced apart by a plurality of columns of windows. The washing equipment in the module may take various forms for washing windows of curtain front buildings and for washing recessed windows.

3,715,775
VACUUM CLEANER
Robert W. Nickelson, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Nov. 30, 1970, Ser. No. 93,575
Int. Cl. A47l *9/00, 9/28*
U.S. Cl. 15—410 **7 Claims**



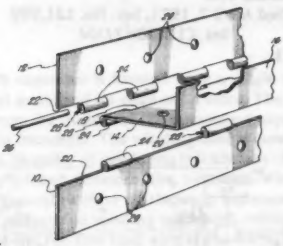
An upright vacuum cleaner comprising floor engaging, suction nozzle means, elongated body means having a handle at the upper end and means pivotally interconnecting the lower end of said body means and said nozzle means. An electric motor driven air impeller and dust collection chamber are provided in the body means, and an electric circuit means, including a switch means, is provided for supplying electrical power to energize the motor. The switch means includes an operator actuated between on and off positions in response to the relative angular positions between the suction nozzle means on the floor and the body means, so that the motor is deenergized whenever the handle is raised to an upright, self-supporting position, and if the handle is pivoted downwardly the switch is closed to energize the motor.

3,715,776
CURTAIN BOX
Masatoshi Tanaka, Tokyo, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan
Filed Oct. 5, 1970, Ser. No. 77,861
Claims priority, application Japan, Oct. 16, 1969, 44/98,646, 44/98,647, 44/98,648
Int. Cl. A47h *1/04*
U.S. Cl. 16—94 D **3 Claims**



A curtain box having integrally provided on its surface a curtain rail or rails and means for fitting the curtain box to a desired location, thereby facilitating the fitting of the box itself and also eliminating the necessity of attaching a separate curtain rail or rails to the box.

3,715,777
HEAVY DUTY HINGE
Lloyd G. Hallamore, Long Beach, Calif., assignor to Hallamore Homes, Inc., Fountain Valley, Calif.
Filed Feb. 25, 1971, Ser. No. 118,759
Int. Cl. E05d *5/06*
U.S. Cl. 16—162 **7 Claims**

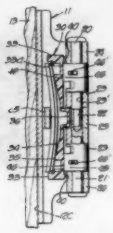


A hinge adapted to connect a pair of massive elements intended to be pivotally secured, one of which is operatively stationary, is disclosed. The hinge includes a pair of flat outer plates and a flanged middle plate sandwiched therebetween. The three plates are pivotally fastened to each other by a pin or shaft extending through interlaced curled sections formed along juxtaposed edges of the respective plates. One of the outer plates is mounted on the operatively stationary element while the other outer plate and the flanged plate are secured to the movable element.

3,715,778
SELF LATCHING HINGE
Harry C. Wilson, 15126 Rayneta Drive, Sherman Oaks, Calif.
Filed Nov. 18, 1970, Ser. No. 90,692
Int. Cl. E05f *1/12*
U.S. Cl. 16—180 **33 Claims**

A self-latching hinge having leaf spring means mounted in a non-metallic retaining cage supported by a curl portion of a first hinge leaf with the opposite ends of the cage positioned in the path of lobes protruding from curl portions of the second

hinge leaf. The cage is resilient and shaped to hold itself and the spring means in assembled position behind the hinge pin. The spring operates to resiliently latch the door or the like supported by the hinge resiliently in closed position. Spring energy released during the opening movement is dissipated gradually as the door opens thereby avoiding abrupt door



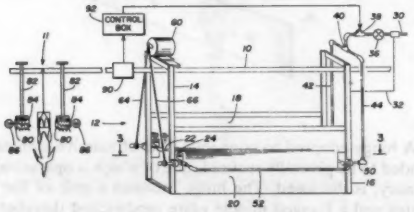
movement. Tangs integral with one hinge leaf are effective to align the hinge axis accurately parallel to the edge of the door while the hinge is being mounted. The other hinge leaf incorporates self-clamping means for mounting the hinge on the door frame. A pair of hinge pins interfit with one another and with the curls with a press fit.

3,715,779

FOWL SINGEING SYSTEM UTILIZING OSCILLATING FLAMES

Bryan T. Snowden, Grapevine, Tex., assignor to Food Equipment Inc., Dallas, Tex.

Filed April 7, 1971, Ser. No. 131,999
Int. Cl. A22c *21/04*
U.S. Cl. 17—11 **7 Claims**



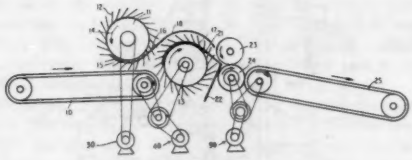
The specification discloses a system for singeing fowl transported by a shackle system. A housing is disposed in the path of travel of the shackle system and elongated pipes are horizontally disposed on opposite sides of the housing and positioned adjacent the middle region of the fowl transported through the housing. The pipes are connectable to a supply of gas and include gas nozzles spaced along the length of the pipes, whereby flames are emitted from the nozzles when the gas emanating therefrom is ignited. A motor rotates an eccentric crank mechanism to oscillate the pipes about predetermined arcs to direct singeing flames over substantially the entire bodies of the fowl being transported therepast. A shaking mechanism is disposed forward of the housing for shaking water from the fowl prior to singeing of the fowl.

3,715,780

APPARATUS FOR THE PROCESSING OF WOOL FIBRES

Malcolm Chaikin, 26 Martin Road, Centennial Park, New South Wales; Desmond Rokfalussy, 187 Carrington Road, Coogee, New South Wales, and Alexander Douglas Dircks, 18 Woolwich Street, Hunters Hill, New South Wales, all of Australia

Filed June 22, 1970, Ser. No. 48,420
Claims priority, application Australia, June 23, 1969, 56893/69
Int. Cl. D01g *19/10*
U.S. Cl. 19—128 **2 Claims**



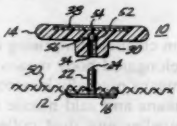
Apparatus for the processing of textile fibers such as wool fibers to form a coherent and even layer of fibers at high velocity for further processing in which fibers are fed on a conveyor belt to a pinned cylinder, the pins of which have a negative inclination and which are forced by rotation of the cylinder into the layer of fibers picking it up from the conveyor and carrying it around. The fibers are then transferred to another pinned cylinder the pins of which also have a negative inclination and which rotates at a faster speed than the first pinned cylinder so that there is a drafting action between them, the fibers being completely stripped from the first pinned cylinder and transferred to the second either by means of a third pinned cylinder the pins of which pass between the pins of the other two or by means of a stripping plate partially encircling the first pinned cylinder to strip the fibers from its pins and lead then under a cover plate which partially surrounds the second pinned cylinder and which serves to hold the fibers while they are penetrated by the pins of the second cylinder. The fibers are finally stripped from the second pinned cylinder and passed to a second conveyor which conveys them for further processing. The negative inclination of the pins assists greatly in overcoming problems of stripping the fibers from the cylinders.

3,715,781

BUTTON ASSEMBLY

Derald M. Salvatori, 12647 Overbrook Road, Leawood, Kans. 66209

Filed Feb. 2, 1971, Ser. No. 111,991
Int. Cl. A44b *1/28, 1/30*
U.S. Cl. 24—90 HA **1 Claim**



A simple button assembly, made up essentially of a button and a button holder, is designed for permanent attachment to garments by the use of a self contained rapidly drying mastic. The button holder is a single unit having a base and a pin, or pointed stem, which extends perpendicularly to the base, and the outer periphery of the base curves in the direction of the stem. This holder is placed on the fabric of a garment by pushing

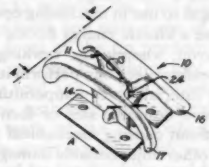
the sharp point of the stem through the fabric at a desired location and its curved periphery aids in preventing its rotation as the base is pressed against the fabric firmly. The button is also of single unit construction having a bore into which the stem of the button holder is received. This bore contains a rapidly drying mastic which is inserted and sealed off from the exterior during manufacture of the button or at least prior to the installation of the button. The button is fitted onto the holder by inserting the stem of the holder into the bore of the button. During this assembly, the stem of the holder breaks the seal over the mastic. When the seal is broken, the mastic flows and then dries almost instantaneously, permanently sealing the stem of the holder to the bore of the button, thereby permanently positioning the button relative to the fabric of a garment. Mastic is present in a volume which, due to its quick drying nature, will not flow beyond the lower edge of the bore of the button. Therefore, no mastic touches the fabric itself. This button assembly may be attached to fabric with very little effort, in only a few seconds.

3,715,782

DEVICE FOR SECURING A LINE

E. Strohm Newell, 2350 6th Avenue, Apt. 9-B, San Diego, Calif.

Filed Dec. 9, 1971, Ser. No. 206,427
Int. Cl. F16g *15/04*, *11/04*
U.S. Cl. 24—116 **13 Claims**



The device comprises a pair of opposing line engaging surfaces having a structural configuration effective for mutually cooperating with a line placed therebetween. The mutually cooperating surfaces have means that are effective to cause the line to be wedged therebetween when a load is directed along the line. Line guiding means are incorporated on the surfaces causing the line to move therebetween when the line is draped or dragged longitudinally along the device. At least one pair of arcuate hook portions extend in the direction toward the line load. The hook portions are laterally displaced with respect to each other and are turned downwardly and away from the direction of the load. The hook portions include an outboard surface and an inboard surface. The device of this invention may be used for securing lines composed of various constructions such as twisted cords, chain links and the end of a bolt on a turnbuckle.

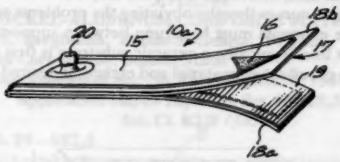
3,715,783

FASTENER ATTACHMENT DEVICE FOR FLEXIBLE SHEET

Kenneth J. Parks, 4 Joseph Lane, Ringwood, N.J., and Constantine F. Economy, 3441 Congress Street, Allentown, Pa.

Filed Feb. 10, 1971, Ser. No. 114,296
Int. Cl. A44b *21/00*
U.S. Cl. 24—265 R **3 Claims**

A fastener attachment device for application to marginal edge portions of flexible sheet materials to facilitate the fastening of such sheet material is described. The device comprises a length of tape coated on one side with a pressure-sensitive adhesive and folded against itself midway along its length to provide an inner adhered-together portion and non-adhered, opposed, outwardly-extending portions retained in separated relation before use of the device by an interposed cover or tear strip member. Fastening means in the form of a snap fastener, eyelet, ring or the like is affixed to the adhered-together portion of the tape. In use, the outwardly-extending



portions of the tape will be separated from the cover or tear strip member and applied flat against opposite marginal side portions of the sheet material to which the device is to be applied.

3,715,784

METHOD OF MAKING A MINIATURE METALIZED CAPACITOR

Charles C. Rayburn, 8501 West Higgins Rd., Glenview, Ill.

Filed Jan. 8, 1971, Ser. No. 104,887
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **5 Claims**

Miniature capacitor is formed from a single strip of dielectric material metalized on each of its sides. The strip is wound generally from the middle of the completed capacitor using its lead wires as mandrels. The winding time is considerably shortened and a plurality of insulating thicknesses of strip material are quickly placed between the two lead wires by initially locating a central portion of the strip between the first lead wire and a retractable winding pin which orbits so as to carry the strip around the first lead wire in the form of a loop which is wound into the capacitor after the second lead wire has been inserted. The winding pin is mounted adjacent an elongated slot. The first lead wire may be loaded in an axial direction at one end of the slot and carried to the other end of the slot by the looped strip as the strip is carried around the lead wire by the orbiting of the winding pin and slot. The second lead wire may then be fed into the slot along the same axis as the first lead wire was fed, and the winding pin retracted, without any interruption in the winding. The leads are retained in the capacitor by heat shrinking the dielectric strip.

3,715,785

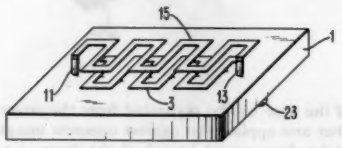
TECHNIQUE FOR FABRICATING INTEGRATED INCANDESCENT DISPLAYS

Alan V. Brown, and Frederick Hochberg, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed April 29, 1971, Ser. No. 138,409
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.11 **24 Claims**

Incandescent "microfilaments" for integrated display devices, and the like, are batch fabricated using planar

technologies. The planar incandescent filaments are made of thin films, suspended to minimize heat conduction losses. Heat losses are additionally minimized by appropriately shaping the ends of the filaments. By utilizing planar technologies all filaments of a display device may be fabricated en masse in a single plane and, individual filaments may be etched to various shapes and curves thereby obviating the problems encountered where elements must be strung between support posts, in a straight line. Typically, a ceramic substrate is first coated with a layer of reflecting material and etched, if desired, to the



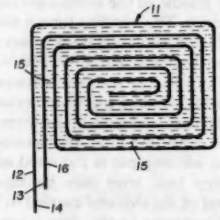
pattern selected for the reflecting surface. Thereafter, a support material, such as glass, is deposited over the substrate and reflecting material. Holes are then drilled into the glass and substrate and filled with conductive material, to thereby form support posts. A filament material, such as tungsten, is then deposited over the support layer so as to make conductive contact with the underlying support posts. By using conventional etching techniques a filament of desired pattern is then formed between the posts. Thereafter the support layer may be etched away leaving the filament suspended between the posts.

3,715,786

METHODS AND APPARATUS FOR INCREASING THE CAPACITANCE VALUE OF A CAPACITOR

Donald R. Brown, Downers Grove, and Otto T. Masopust, Jr., Clarendon Hills, Ill., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 12, 1971, Ser. No. 142,466
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **26 Claims**



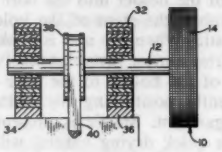
The capacitance value of a metallized film capacitor is increased by applying a voltage across the plates of the capacitor to generate an electrostatic attraction force therebetween to draw the metallized films closer together into a higher capacitance configuration. Heated wax is then impregnated into the space between the plates of the capacitor and allowed to cool to fix the plates in the higher capacitance configuration. The capacitance value of a metallized film, wax impregnated capacitor is increased by heating the capacitor to lower the viscosity of the wax therein, by applying a voltage across the plates of the capacitor to generate an electrostatic attraction force therebetween to draw the metallized films closer together through the heated wax into a higher capacitance configuration, and by cooling the capacitor to increase the viscosity of the wax therein to fix the plates in the higher capacitance configuration.

3,715,787

KINETIC ENERGY DEVICE FOR FORMING WORK PIECES

Arthur Franklin Hudson, P.O. Box 1025, Huntington, Ind.

Filed Nov. 25, 1970, Ser. No. 92,669
Int. Cl. B23d *67/00, 69/00, 71/00*
U.S. Cl. 29—76 R **7 Claims**



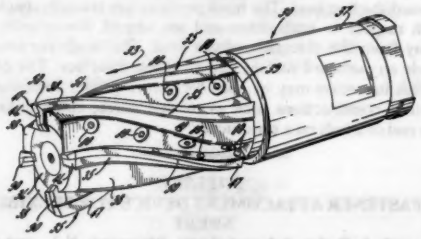
A kinetic energy device at substantial rates of speed develops an apparent hardness which is considerably in excess of its inherent hardness. A rotatable member having a plurality of protuberances and consisting of metal or other suitable composition, will develop properties at high rate of speed which is a function of the speed itself, thus the material comprising the protuberances takes on apparent hardness many times that of the same material in a static condition. The present invention utilizes this property of high speed in the order of 10,000 – 100,000 surface feet per minute rotational speed, to develop apparent hardness in the projectiles on the periphery of the machining wheel so that the designer has not only available to him a wide range of materials which were heretofore impractical to use in machining operation, but also has the ability to use a kinetic energy device in such applications as stock removal, wherein the working piece, i.e., the kinetic energy possessing piece can perform its intended function at lower wear rate, at lower temperatures, the product removed is in a more desirable size or form, and the work piece is formed without causing mechanical rupturing of the total work piece or other objectionable damage thereto.

3,715,788

ROTARY CUTTER WITH HELICAL BLADES

James C. Ayer, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed March 1, 1971, Ser. No. 119,575
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 A **22 Claims**



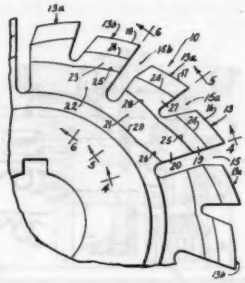
The cutter includes serrated helical blades detachably fastened by screws to a rotatable body with serrated, blade-receiving slots whose centerlines are offset from and preferably inclined relative to the rotational axis of the body to enable the blades to be located in the slots with the centerlines of the blades spaced from the axis while always keeping the serrations on the blades in precise mating engagement with the serrations in the slots.

3,715,789

HOB

Stuart J. Johnson, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed July 19, 1971, Ser. No. 163,800
Int. Cl. B26d 1/12
U.S. Cl. 29—103 B 12 Claims



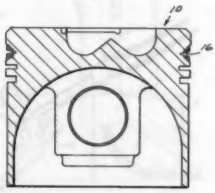
A hob for cutting gears and the like in which the teeth are formed in repeating sets of at least two teeth and the teeth of each set have different radial lengths whereby all of the teeth cut to generate the final form of the root portion of the gear teeth and only some of the hob teeth generate the final form of the tip portions of the gear teeth. While the hob may be a finishing tool, more usually it is a rough-cutting tool and, in this context, the final form is the form of the gear teeth before finishing where that is required. The teeth of the hob, when used as a rough-cutting tool, are given a profile wich permits the metal that must be removed by the finishing tool to be distributed on the gear teeth in a preselected manner so as to make more effective use of the finishing tool.

3,715,790

METHOD OF REINFORCING PISTON RING GROOVES

William C. Reinberger, Independence, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 762,720, Sept. 26, 1968, abandoned. This application Jan. 13, 1971, Ser. No. 106,279
Int. Cl. B23p 15/10
U.S. Cl. 29—156.5 R 6 Claims



Method of making an aluminum alloy piston with a ring groove reinforcement wherein a grooved piston blank is cleaned to remove any oxide films, and a bonding metal is sprayed over the surface of the groove while the blank is at a temperature of from about 330° to 390° F., and thereafter a wear resistant metal is sprayed into the groove while the blank is still at a temperature within the aforementioned range to thereby fill the groove.

3,715,791

NICKEL-ALUMINUM COMPOSITE MATERIAL

Aurel I. Berghezan, Rhode-St-Genese, Belgium, assignor to Cabot Corporation, Boston, Mass.

Continuation of Ser. No. 688,945, Dec. 6, 1967. This application March 10, 1970, Ser. No. 18,334
Int. Cl. B22f 1/00
U.S. Cl. 29—182.5 4 Claims

A nickel-aluminum composite metallic material produced from nickel and aluminum powders characterized by high strength throughout a wide range of temperatures and having excellent resistance to oxidation at elevated temperatures.

3,715,792

POWDER METALLURGY SINTERED CORROSION AND WEAR RESISTANT HIGH CHROMIUM REFRACTORY CARBIDE ALLOY

Arnold L. Prill, Edmond, Okla., and Stuart E. Tarkan, Monsey, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,787
Int. Cl. C22c 29/00
U.S. Cl. 29—182.7 4 Claims

A corrosion and wear resistant high chromium refractory carbide alloy is provided by powder metallurgy suitable for use as a seaming tool in the food canning industry comprising primary carbide grains of at least one refractory carbide selected from the group consisting of TiC, CbC, VC and TaC dispersed through a high chromium alloy matrix consisting essentially by weight of about 14 to 24 percent chromium, about 0.4 to 1.2 percent carbon, up to about 3 percent nickel, up to about 5 percent molybdenum, and the balance essentially iron.

3,715,793

PLATED SUPER-COAT AND ELECTROLYTE

John H. Kefalas, Billerica, and Joseph A. Loycano, Bellingham, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 605,374, Dec. 28, 1966, Pat. No. 3,531,322. This application May 4, 1970, Ser. No. 46,582
Int. Cl. B32b 15/04
U.S. Cl. 29—194 12 Claims

Multi-layered magnetic record surfaces having a non-magnetic nickel super-coat, electroless plated on the magnetic layer for protection against wear and corrosion, especially with non-metal substrates; also allowing superposition of identical magnetic layers with proper magnetic separation and for providing an etchable substrate strike for safer plating of discrete patterns of magnetic films. Also, methods and solutions for electroless plating such non-magnetic films by simple, convenient modifications of a reliable magnetic electroless plating method.

3,715,794

REMOVAL TOOL FOR AUTOMOTIVE RADIATOR HOSE

Robert L. McCollum, and Robert Holcombe, Royston, Ga., assignors to Thomas M. Strickland, Royston, Ga.

Filed Feb. 10, 1971, Ser. No. 114,152
Int. Cl. B23p 19/00
U.S. Cl. 29—235 7 Claims

Nesting, pivoted bifurcated elements are mounted at one end of a elongated handle, and a remote-control linkage is

provided whereby the elements can be forcibly spread apart to remove a radiator hose from the radiator neck. The opening of

the inner element is tapered to accommodate various sizes of necks and hoses.

3,715,795

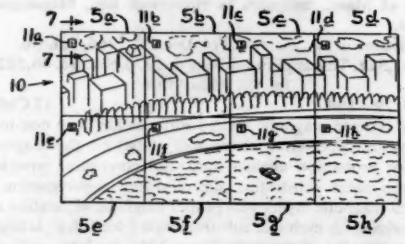
PROCESS OF MAKING A MIRROR BACKED PICTURE UNIT

Hoyne E. Greenberg, Beverly Hills, Calif., and Max L. Wexler, Chicago, Ill., assignors to Hayne Industries Inc., Los Angeles, Calif.

Division of Ser. No. 864,732, Oct. 8, 1969, Pat. No. 3,589,507. This application June 4, 1971, Ser. No. 149,997

Int. Cl. B23p *17/00*

U.S. Cl. 29—412 6 Claims



A method of making mural forming plates which form a much larger mural when placed in juxtaposed relation comprising projecting a picture to be displayed on a photo-sensitized silk screen of at least the size of the desired mural, processing the light-exposed silk screen to provide a pattern of open screen areas corresponding to the picture involved, applying a pigment-forming material through said processed silk screen to one surface of a transparent plate at least as large as the mural, applying a mirror-forming surface over the silk screened pigment-forming material on the plate involved, and cutting the plate into relatively small, easy-to-handle pieces.

3,715,796

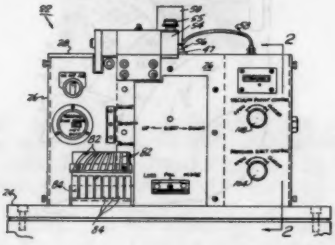
FLUID POWER EJECT MECHANISM FOR A POWDER COMPACTING PRESS AND METHOD OF COMPACTING

Georges D. DeTroyer, Detroit, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.

Division of Ser. No. 861,611, Sept. 29, 1969, Pat. No. 3,645,658. This application Nov. 3, 1971, Ser. No. 195,515

Int. Cl. B22f *3/02*; B23p *19/04*

U.S. Cl. 29—420 6 Claims



A fluid power system for a pick-up and discharge mechanism for small manufactured articles or parts, such as made by a powder compacting press or the like. After compacting in a die cavity, the finished parts upon ejection from the die cavity or cavities are picked up by a pick-up head operatively connected to a suction source for displacement of the finished parts over a discharge port or ports through which the finished parts are individually discharged by means of a gentle blast of pressurized air. The suction forces to pick up the finished parts is obtained from a flow of air through an appropriate venturi-like aspirator assembly.

3,715,797

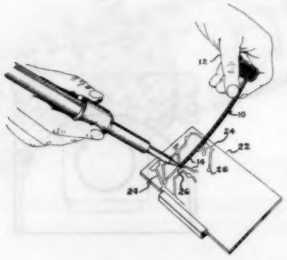
METHOD FOR SOLDER REMOVAL

Thomas J. Jackson, Fremont; Dan A. Weltsch, Sunnyvale, and Stephen J. Beattie, Redwood City, all of Calif., assignors to Wik-It Electronics Corporation

Division of Ser. No. 667,406, Sept. 13, 1967, abandoned. This application Oct. 23, 1970, Ser. No. 83,597

Int. Cl. B23p *19/00*

U.S. Cl. 29—426 4 Claims



A rope-like member of braided heat conducting metallic wires coated with a second metal and a flux is applied to a solid solder joint. Heat applied to the rope-like member liquifies the solder which in turn is absorbed into the member thereby removing solder from the joint.

3,715,798

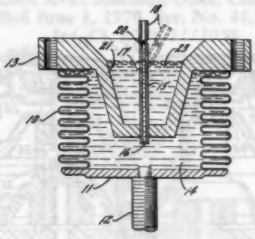
ASSEMBLING BELLOWS DAMPER UNIT

Gerald F. Ostroot, St. Cloud, and Robert H. Torborg, Cold Spring, both of Minn., assignors to DeZurik Corporation, Sartell, Minn.

Division of Ser. No. 726,089, May 2, 1968, Pat. No. 3,608,436. This application June 12, 1970, Ser. No. 57,861

Int. Cl. B23p *19/04*

U.S. Cl. 29—454 **5 Claims**



A liquid-filled force damper unit is described in which a spring metal bellows unit is vacuum-filled with damping fluid to eliminate all air bubbles, and provided with a frangible seal. The unit is assembled to a reservoir which is filled with damping fluid above the level of the seal, which is then broken off, and a relatively flexible reservoir diaphragm is added to allow the unit to be used in any position.

3,715,799

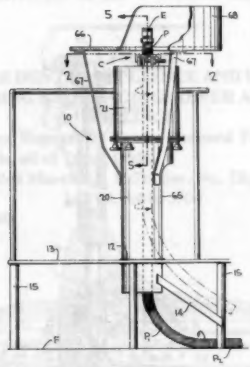
METHOD FOR FLEXIBLE PIPE WELDING

Edgar M. Flood, Paducah, and William H. Green, Hickory, both of Ky., assignors to Weld-Eze, Inc., Paducah, Ky.

Filed Nov. 17, 1970, Ser. No. 90,403

Int. Cl. B23k *31/02*

U.S. Cl. 29—475 **5 Claims**



Method and apparatus are disclosed for welding a pipe extension to a flexible, elongated pipe or hose wherein one end of the pipe is held upright for welding and the other end of the pipe is supported at an angle, such as on a horizontal surface of a cooperating support. The complete pipe including both ends and the intermediate angular section are rotated at substantially constant speed while a bead of weld material is applied in the weld area to give a uniform, leakproof weld. Since the one end of the pipe is upright, the extension may be rested on the end face without clamping and the welding rod is held stationary during welding. The clamp means for holding the welded end of the pipe is carried by a concentric support tube and rotatable cap assembly through which the pipe passes; the cap being stabilized by top and bottom bearings. The clamp includes opposed pivotal jaws on the annular top wall of the rotating cap; the jaws being tightened by screw means at the opposite end. Two-piece split collars are selected to roughly correspond to the outer dimension of the pipe. A fixed chain on the cap is used to drive the same from a motor driven sprocket, which combination retains the cap captive in the axial direction. A pedestal mount adaptor may be used for large diameter pipe.

3,715,800

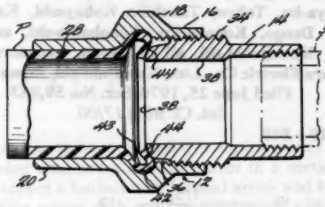
METHOD OF MAKING A COUPLING JOINT

Wilbur R. Leopold; Frank C. Hackman; Carl E. Floren, and Wallace E. Gould, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Division of Ser. No. 885,462, Dec. 16, 1969, Pat. No. 3,687,492. This application Oct. 29, 1971, Ser. No. 194,067

Int. Cl. B29c *27/30*

U.S. Cl. 29—506 **4 Claims**



A method of making a service pipe coupling or joint for use in fluid distribution systems, the coupling or joint utilizing a plastic pipe, a flare-type coupling nut for coupling the plastic pipe into a distribution system, the coupling nut cooperating with a tubular body member which may be another pipe, a valve, or other fitting. The method includes cold flaring the end portion of the plastic pipe while within the coupling nut beyond its elastic limit or memory into an annular upset bead-like portion terminating in an inwardly turned lip, the annular upset bead-like portion trapping the plastic pipe axially with respect to the coupling nut. Then the method further involves the application of the tubular body to form the coupling or joint by further forming the bead-like flare to provide a seal and packing and to increase the resistance of pipe pullout from the joint.

3,715,801

TOOL CHANGER FOR MACHINE TOOL

Yoshikazu Sato, No. 1,026, 4-chome, Shimotakaido, Suginami-ku, Tokyo, and Makoto Sato, No. 1-10, 1-chome, Nakano, Nakano-ku, Tokyo, Japan

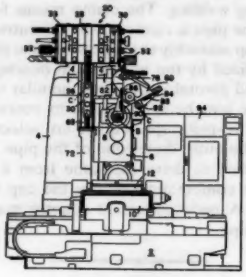
Filed March 4, 1969, Ser. No. 804,220

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **6 Claims**

A tool changing mechanism for a machine tool having a horizontal spindle. A rotatable magazine is provided with a plurality of guides for supporting and guiding a plurality of tool cartridges. Each cartridge is provided with a plurality of vertically aligned tools. The magazine is indexed to align a selected cartridge with a transfer station. The cartridge is shifted into the transfer station and is positioned to present a selected tool to a transfer mechanism for removal of the tool

and insertion into the spindle. The tool is returned to the cartridge by the transfer mechanism after use. A tape controlled



motor means coordinates the operation of magazine, cartridges, and transfer mechanism to provide for returning one tool while another tool is operating on the work.

3,715,802

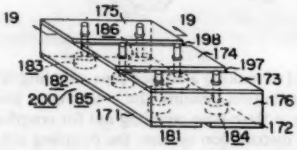
SEMICONDUCTOR APPARATUS AND METHOD FOR MANUFACTURING THE SAME

Masanobu Suenaga, Minami-ku, Yokohama-shi; Tetsuo Machii, Isogo-ku, Yokohama-shi; Takahiro Sawano, Setagaya-ku, Tokyo; Takehiko Kobayashi, Kawasaki-shi; Tadao Dengo, Kohoku-ku, Yokohama-shi, and Tetsuzo Nakai, Kawaguchi-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 25, 1970, Ser. No. 59,853

Int. Cl. B01j *17/00*

U.S. Cl. 29—588 **8 Claims**



A semiconductor apparatus comprising a first and a second electrode substrate arranged substantially in parallel to each other, a semiconductor element containing a plurality of electrode members located between and opposite to the first and second electrode substrates, a layer of organic adhesive material inserted between the first and second electrode substrates for their integral bonding, and a means for connecting the first and second electrode substrates with the aforesaid plurality of electrode members mechanically as well as electrically.

3,715,803

ROTARY DRY SHAVER WITH TILTABLE SHEAR PLATES

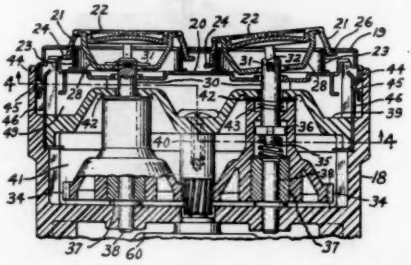
Tracy B. Tyler, 7936 Byron Ave., Miami Beach, Fla.

Filed Feb. 16, 1971, Ser. No. 115,546

Int. Cl. B26b *19/16*

U.S. Cl. 30—43.5 **6 Claims**

A rotary dry shaver comprising a component housing, a pair of tiltable cutting elements with exposed apertured shear plates, a bladed rotary cutting member cooperative with the inner surface of the shear plates and coactively tiltable therewith, a driving shaft for the cutting members, the shear plates and cutting members normally disposed at a right angle to the shaft axes, the cutting elements independently supported axially on a spherically radiused surface whereon they are freely tiltable at diverse angles relative to the shaft axes, a removable cutting element retaining frame with apertures through which a portion of each of the cutting elements projects, the outer surface of the projecting portion correspondingly spherically radiused and fittingly and tiltably retained by and in the frame apertures, a chamber in the housing beneath said frame to receive hair clippings, apertures through the housing sidewalls communicating with the chamber, hinged side plates to open and close the wall apertures, the side plates and said frame comprising cooperative



engaging portions by which the frame is positively secured in place when the side plates are closed, the shear plate apertures and the blades of the cutting member opposedly two-edged for cutting in either rotational direction, a driving motor, means for reversing the rotation of the cutting member at desired intervals, a toothed edge reciprocal hair trimming clipper embodied in the housing, the toothed edge of which may be projected from or retracted into the housing, the clipper being operably connected to a driving element when it is projected and disconnected when it is retracted.

3,715,804

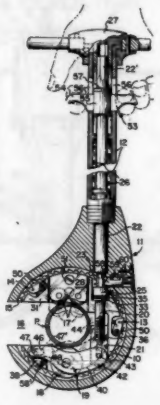
FREE FULCRUMED LEVER ACTION FOR THE CUTTING WHEEL PIPE CUTTER

Elmer G. Kelley, 14300 Clayton Road, San Jose, Calif.

Filed Feb. 19, 1971, Ser. No. 116,911

Int. Cl. B23d *21/08*

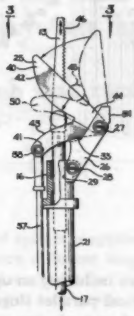
U.S. Cl. 30—102 **8 Claims**



A free fulcrumed yoke supporting the cutting wheel of a ratchet type pipe cutter within a C-shaped cutting head, the yoke embracing a rider guided for lineal movement relative to and on an adjusting screw having a thrust bearing in its head portion fixed to pull the rider upon turning of the screw when

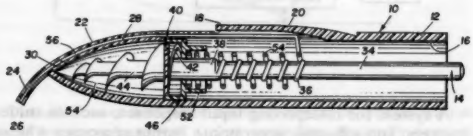
the latter has keyed connection with a spring loaded manipulatable adjusting rod provided with finger engageable triggers, and keeper means for holding the triggered rod in retracted position until the keeper is engaged by the head portion of the adjusting screw as it approaches axial alignment with the adjusting rod.

3,715,805
IMPROVEMENT IN A TREE PRUNING SAW
Donald M. Fraser, Los Angeles, Calif.
(4416 Lennox Ave., Sherman Oaks, Calif. 91403)
Filed June 1, 1970, Ser. No. 41,970
Int. Cl. B27b *11/10*
U.S. Cl. 30—166 **8 Claims**



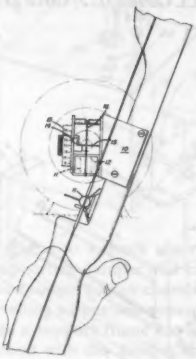
An improvement in a tree or shrub branch pruning saw apparatus having a motor providing motive power for a reciprocating saw blade, and comprising a saw blade reciprocably carried on the end of a tubular pole opposite its other end at where the power source is carried, and a V-notched member pivotally mounted on a link which in turn is pivotally mounted to the end of the pole. Means such as an axially slidable handle, is provided along the pole's length and is pivotally connected to the V-notched member. Manual to-and-from (axial) motion provided the sliding handle pivots a selected branch held in the V-notched member through or across the path of the reciprocating saw blade. Stop means are provided for limiting the arc of movement of the V-notched member.

3,715,806
DISPOSABLE DENTAL APPLIANCE AND METHOD FOR PREPARING AND PLACING SILVER AMALGAM FILLINGS
Fuller Warden; Eugene W. Lewis; Bernard F. McNickle, and Jack H. Mills, all of Tulsa, Okla.
Filed March 11, 1970, Ser. No. 18,452
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **5 Claims**



A dental hand piece for mixing silver alloy and mercury to provide an amalgam for tooth fillings, extruding and carrying the amalgam into the tooth cavity and packing the amalgam in the cavity through the use of a single tool. The hand piece is disposable and is preloaded with measured proportions of the silver alloy and mercury which are stored in separate compartments until mixing thereof is desired to provide the amalgam. The tool is adapted for operation by the dentist's Doriot type straight hand piece, or the like, and automatically mixes the amalgam, extrudes the amalgam from the carrier portion thereof for deposit directly into the tooth cavity, and selectively packs the amalgam in the cavity upon response to actuation of the tamper mechanism by the dentist.

3,715,807
ARCHERY BOW SIGHT
Fraderick R. Heffer, 574 Meadowbriar Rd., Rochester, N.Y.
Filed Nov. 24, 1970, Ser. No. 92,477
Int. Cl. F41g *1/00*; F41b *5/00*
U.S. Cl. 33—265 **3 Claims**



An archery bow sight comprises a mounting means such as a bracket having attached a thereto mirror in a vertical plane adapted to reflect a horizontally located arrow and having attached sighting means such as a cross hair sight with a movable blade shaped horizontal member adapted to be adjusted to predetermined angles or distances.

3,715,808
VERTICAL ALIGNMENT GAUGE
Albert V. Petrik, 2866 Joyce Road, Roslyn, Pa.
Division of Ser. No. 866,995, Oct. 16, 1969, Pat. No. 3,638,325. This application Aug. 13, 1971, Ser. No. 171,479
Int. Cl. G01c *15/10*
U.S. Cl. 33—347 **2 Claims**

A telescopically adjustable tubular construction for upright arrangement having a central opening in its upper end and

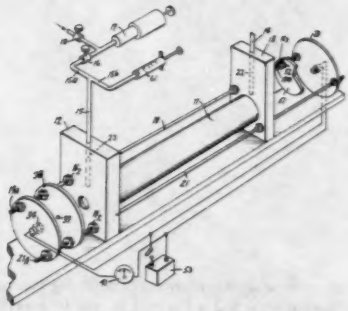
permanent magnet means extending laterally from an upper region of the tubular construction for holding engagement with a door jamb or the like, a standoff member adjacent to a lower region of the tubular construction, a window provided in a lower region of the tubular construction, and plumb bob means suspended interiorly of the tubular construction visually accessible through the window.

3,715,809

EDUCATIONAL ATMOSPHERIC PARTICLE DETECTOR

Theodore A. Rich, Schenectady, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Nov. 5, 1971, Ser. No. 196,012
Int. Cl. G09b *23/12*; G01n *21/00*
U.S. Cl. 35—19 B **10 Claims**



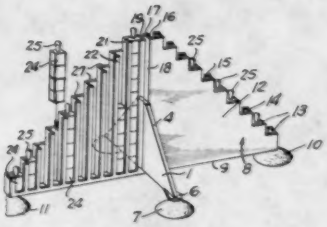
An educational atmospheric particle detector of low cost construction that can be assembled, disassembled and operated by students and apprentice technicians for classroom and laboratory study purposes. The particle detector is of the condensation nuclei meter type comprising a hollow tubular member that serves as an expansion cloud chamber and is mounted between two end blocks supported on a plurality of threaded rods. The end blocks have inlet and outlet passageways which communicate with the interior of the tubular expansion cloud chamber, and have aligned openings through which a transmission light beam passes. Suitable collimating lens are supported within the aligned openings in the end block members for focusing the light from a light source positioned at one end of the cloud chamber, onto a photo cell or other light sensitive device positioned at the opposite end of the expansion cloud chamber. A novel rotatable disc or diaphram which serves as a light shutter is supported on one of the plurality of supporting rods and can be rotated into or out of the light path in order to modulate the amount of light which is allowed to impinge on the photo cell or other light sensitive detector. With this arrangement zero adjustment calibration of the instrument can be performed. Additionally, a pin hole aperture formed in a small disc supported on the supporting rod is located in the light path between photo cell and adjacent lens. The pin hole aperture serves to restrict the measured light to those light rays parallel to the cloud chamber axis and are normally transmitted without interruption. Upon expansion of the space within the cloud chamber so as to condense water droplets about the particles entrained in a sample gaseous atmosphere being monitored, the cloud of water droplets scatters the light beam and results in a change in the electric output signal from the light sensitive detector device which is a measure of the number of particles entrained in the sample gaseous atmosphere. Additionally, a two-stage expansion is provided for which allows the detector to be used for particle size measurement purposes.

3,715,810

EDUCATIONAL GAME

Harry D. Coates, Apt. 417, 5021 Seminary Rd., Alexandria, Va.

Filed June 4, 1971, Ser. No. 149,918
Int. Cl. G09b *1/16*
U.S. Cl. 35—35 R **4 Claims**



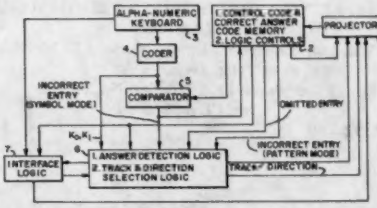
An educational game including an upright game board having pluralities of vertical parallel slots of varying lengths on opposite sides thereof and playing pieces each capable of being inserted in one of said slots with a side of the playing piece visible and players apply lettering representing words to said playing piece sides and insert each playing piece in an appropriate one of said slots in an effort to fill a given number of said slots before an opponent.

3,715,811

REMEDIAL BRANCHING TEACHING SYSTEM

Francis T. Thompson, Murrysville, and Shan C. Sun, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 13, 1970, Ser. No. 80,359
Int. Cl. G09b *7/04*
U.S. Cl. 35—48 **15 Claims**



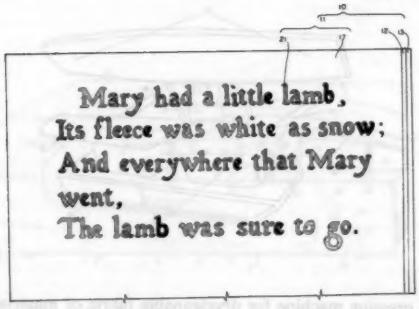
A system for interpreting input responses, such as student answers, and effecting appropriate output responses wherein the system is operative in a plurality of modes for interpreting input responses, for example, as correct, incorrect, or nearly correct, with the appropriate output response being effected so that a student progresses through programmed instructional material according to answers given at various points in the instructional material either in a primary or remedial manner.

3,715,812

COLOR CODED PRONUNCIATION SYMBOL SYSTEM

Lorna Beth Novak, 2023 Street, Amarillo, Tex.

Filed Dec. 7, 1970, Ser. No. 95,433
Int. Cl. G09b 17/00
U.S. Cl. 35—35 J 9 Claims



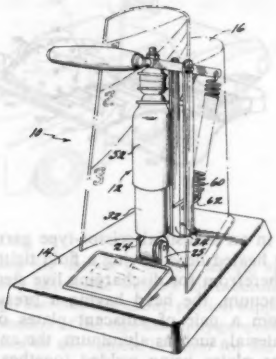
A color coded symbol system is applied to the letters of the English alphabet for such different language sounds as such letters have in different words to facilitate the pronunciation and reading and learning of such words.

3,715,813

SHOCK ABSORBER DEMONSTRATION STAND

John A. Wiegand, Northbrook, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Oct. 4, 1971, Ser. No. 186,200
Int. Cl. G09b 25/00
U.S. Cl. 35—49 4 Claims



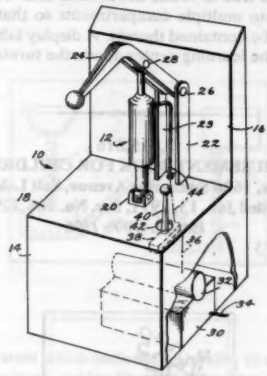
The disclosure embraces a shock absorber demonstration stand having a base and a post extending generally perpendicularly from the base; a lever arm is pivotally attached intermediate its ends to the post adjacent its upper end and a shock absorber has one end mounted on the base and its other end connected to the lever arm on one side of the post; a tension spring is connected at one end to the lever arm on the side of the post opposite the shock absorber and the other end of the tension spring is connected to the post.

3,715,814

SHOCK ABSORBER DEMONSTRATION STAND

John A. Wiegand, Northbrook, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Sept. 28, 1971, Ser. No. 184,639
Int. Cl. G09b 25/00
U.S. Cl. 35—49 5 Claims



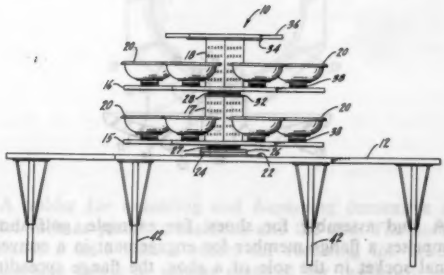
The disclosure relates to a shock absorber demonstration stand for a load supporting damper unit of the type having a variable volume load supporting air chamber therein, which is utilized in load levelling suspension systems. The demonstration stand includes a support frame having a movable lever arm mounted thereon with the damper unit having one end fixedly attached to the frame and its other end attached to the movable lever arm so that upon actuation of the lever arm, the damper unit can be extended or contracted along its longitudinal axis. The demonstration stand further includes an air compressor unit which is housed in the frame and is of the type which substantially continuously supplies fluid at a predetermined pressure to a constant volume chamber. Fluid pressure is supplied to the air chamber of the damper unit through a conduit and a control valve, the conduit being connected to the chamber in the compressor unit. The control valve is manually operable so that an individual can control the amount of fluid pressure delivered to the air chamber of the damper unit.

3,715,815

LEARNING CENTER

Robert B. Lewis, P. O. Box 2190, Aspen, Colo.

Filed July 31, 1970, Ser. No. 60,027
Int. Cl. A47b 41/04
U.S. Cl. 35—60 1 Claim



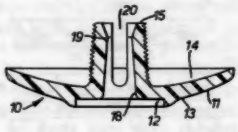
A learning center for pre-school children comprising a worktable having attached perpendicularly to one face a sup-

porting rod having arranged thereon a plurality of turntables and a plurality of display boards. The turntables, aligned parallel to the worktable, are free to revolve independently of one another in a clockwise or counter-clockwise direction about the supporting rod. The display boards can be constructed to revolve in conjunction with the turntables or to remain stationary. Attached at the outer periphery of each turntable are a plurality of containers spaced equidistant from each other and free to rotate about their axis. The containers are divided into multiple compartments so that a variety of materials can be contained therein. A display table is attached at the top of the learning center above the turntables and display boards.

3,715,816
AMUSEMENT BOOK FOR CHILDREN
Earle A. White, 1626 Sunnyside Avenue, Salt Lake City, Utah
Filed Jan. 13, 1971, Ser. No. 106,229
Int. Cl. G09b *1/06*
U.S. Cl. 35—73 **11 Claims**

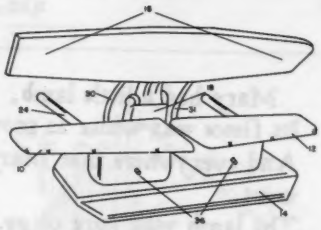
An amusement book for children including on pages thereof animal representation provided with releasable retaining means for releasably receiving the animal's natural food and, in combination therewith and on the same or an opposite page, the said food in its store or natural habitat for selective movement and releasable attachment to the animal representation proximate its mouth area.

3,715,817
SHOE STUDS
David John White, Crowborough, and Benjamin Henry Knight, Groombridge, England, assignors to White Knight Products Limited, Crowborough, England
Filed Jan. 17, 1972, Ser. No. 218,210
Claims priority, application Great Britain, Mar. 9, 1971, 6,333/71
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **10 Claims**



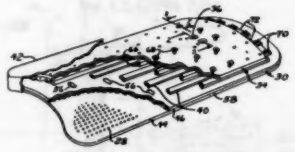
A stud assembly for shoes, for example, golf shoes comprises a flange member for engagement in a conventional socket in the sole of a shoe, the flange spreading the load over a suitable area of the sole of the shoe and a stud member removably press fitted into a central bore in the flange member.

3,715,818
METHOD AND APPARATUS FOR PRESSING FABRICS
James E. Sassman, 34 Stoniker Drive, Trenton, N.J.
Continuation of Ser. No. 758,735, Sept. 10, 1968, abandoned.
This application July 20, 1970, Ser. No. 64,027
Int. Cl. D06f *71/34*
U.S. Cl. 38—15 **3 Claims**



A pressing machine for drycleanable fabric or material includes a stationary buck and a movable head. The buck is operated such as to be at substantially room temperature, and has a plurality of apertures in its pressing surface communicating with a chamber which is maintained under continuous vacuum. The head has a plurality of apertures in its pressing surface which communicate with a steam chamber. When the head is caused to move into engagement with the buck, steam is forced through the apertures in the press head to press the fabric or material held in the machine.

3,715,819
PRESS HEAD CONSTRUCTION
Richard M. Hanson, Salt Lake City, Utah, assignor to McGraw-Edison Company, Elgin, Ill.
Filed Sept. 7, 1971, Ser. No. 178,284
Int. Cl. D06f *71/34*
U.S. Cl. 38—16 **10 Claims**

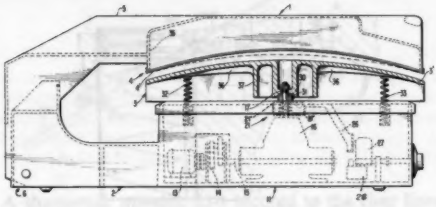


For use in an industrial scissor-type garment press, an electrically heated head having a fluid tight chamber and openings therefrom for discharging live steam and/or for drawing vacuum, the head having a press face element formed from a pair of adjacent plates of highly conductive material, such as aluminum, the entire peripheral edge of the plates being welded together, the adjacent faces of the plates being flush except for channels in one plate that define with the opposite plate the chamber where the openings are provided through the press face plate from the channels, a fitting connection through the backup plate to the steam channels, spacers secured to the backup plate and a mounting plate secured to the spacers, elongated electric strip heating elements fitted between the backup and mounting plates and the spacers, bolts threaded in the mounting plate urging the heating elements against the backup plate, and taps in the mounting plate for securing the head relative to the press.

3,715,820
IRONING PRESS

Wolfgang Hentschel, 8000 Munich 49, Germany, assignor to Dornier A.G., Friedrichshafen/Bodensee, Germany

Continuation of Ser. No. 867,318, Oct. 17, 1969, abandoned.
This application Nov. 4, 1970, Ser. No. 86,936
Claims priority, application Germany, Nov. 2, 1968, P 18 06 776.0
Int. Cl. D06f 71/00
U.S. Cl. 38—17 4 Claims

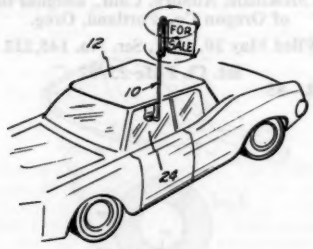


This invention relates to an ironing press comprising buck means having a convex curvature and head means having a concave curvature, and a pressure mechanism for pressing said means together, one of said means being bendable and of a flatter curvature than the other, and the other of said means being rigid.

3,715,821
VEHICLE SIGN

Edward L. Hawes, 405 East Goulson, Hazel Park, Mich.

Filed Oct. 12, 1970, Ser. No. 79,727
Int. Cl. G09f 7/00
U.S. Cl. 40—129 C 10 Claims

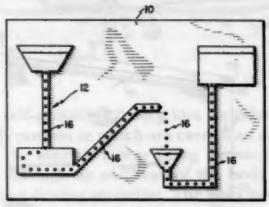


A sign assembly for use on a vehicle having at least one generally vertically adjustable window for mounting a clamp portion of the sign thereto. The clamp portion supports a standard and frame section of the sign assembly generally upwards and above the roof of the vehicle in order for the sign to be visible from all directions. Adjustment and locking means are provided on the standard to provide substantially vertical positioning of the sign regardless of the configuration of the window edge. In a first embodiment the sign has a flag portion mounted to the frame section which is rotatable in order to attract attention. The sign frame section is adapted to easily mount and dismount different flag portions to the assembly and at the same time to hold the flag portions taut and securely mounted. In a second embodiment, the sign is securely fastened to the standard and adjustment means are provided not only to vertically position the sign but also to adjust and lock the sign in any axial rotational position.

3,715,822
DISPLAY SYSTEM

Lindsey B. Hansen, Jr., Ogden, and Val D. Hyer, Sunset, both of Utah, assignors to Control Graphics Company, Ogden, Utah

Filed Nov. 16, 1970, Ser. No. 89,748
Int. Cl. G09f 13/18
U.S. Cl. 40—130 K 10 Claims

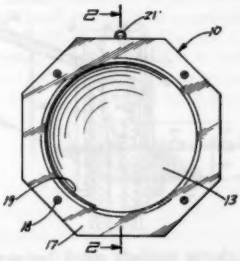


A display system which includes a plurality of separately activated light sources, a plurality of light guides coacting with each light source such that one end of each light guide is juxtaposed with a light source and the opposite end of each light guide is positioned in a display face such that the opposite ends of the guides are lighted according to a predetermined program when the light sources are activated. The light sources are programmed and the light guides are arranged in the display face to simulate light movement over the display face when the display system is operated.

3,715,823
DECORATIVE ARTICLE HOLDER

Cleo A. Brossard, Buffalo, Minn.
(4400 Brunswick Ave. N., Minneapolis, Minn. 55422)

Filed Feb. 26, 1971, Ser. No. 119,195
Int. Cl. G09f 1/12
U.S. Cl. 40—152 10 Claims



A holder for mounting and displaying decorative articles such as plates, medallions and the like. The holder includes a base with a recess for receiving the article, cushioning fabric or similar material for resiliently supporting the article and retaining means for holding the article in the recess. The retaining means may preferably be transparent so as not to obscure any of the article.

When the article to be mounted is transparent, the cushioning material, being visible through the article, is selected to enhance the appearance of the article.

3,715,824

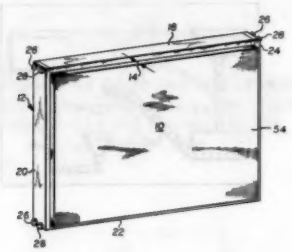
FRONT LOADING VARIABLE DEPTH PICTURE FRAME

Arnold Rochman, 3636 16th Street N.W., Washington, D.C.

Filed Dec. 14, 1970, Ser. No. 97,578

Int. Cl. G09f 1/12

U.S. Cl. 40—152 **6 Claims**



A framework structure is provided whereby pictures may be mounted through the frontal plane of a quadrilateral frame, with bracket means being provided upon the frame for attachment to the rear side of the picture. The bracket means are adjustably spaced relative to the frontal plane of the frame to enable adjustability of the picture relative to the frontal plane of the frame.

3,715,825

CARTRIDGE CASE EJECTOR IN A FIREARM TO BE OPENED BY BREAKING

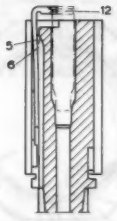
Leo Ilmonen, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Oct. 22, 1970, Ser. No. 82,991

Claims priority, application Finland, Oct. 24, 1969, 3072/69

Int. Cl. F41c 15/00

U.S. Cl. 42—47 **3 Claims**



For a firearm which is opened by breaking it and in which a cartridge with grooved base is used, an ejector is disclosed which moves backwardly when the firearm is opened. The invention is particularly characterized in that the ejector, which moves in a guiding groove in the firearm, and said groove are so shaped that when the ejector moves backward on opening the firearm, the ejector bends to the side, whereby a prong on the ejector moves in outwardly direction from the groove in the base of the cartridge case.

3,715,826

FIREARM MAGAZINE RELEASING LEVER AND TRIGGER SAFETY

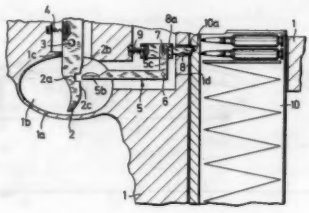
Paul Seifried, Badenweiler, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed March 11, 1971, Ser. No. 123,184

Claims priority, application Germany, March 24, 1970, P 20 14 328.6

Int. Cl. F41c 17/02, 17/00, 17/08

U.S. Cl. 42—70 E **3 Claims**



A firearm in particular an automatic rifle, which comprises a housing, and a trigger guard received by the housing. A trigger lever extends into the trigger guard and a magazine releasing lever is provided. A magazine is operatively connected with the magazine releasing lever and an operative connection is arranged between the trigger lever and the magazine releasing lever, in order to lock one of the levers upon operation of the other of the levers.

3,715,827

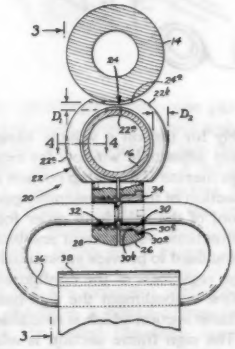
MAGAZINE TUBE MOUNTING FOR SLING SWIVEL

Preston V. McKinzie, Auburn, Calif., assignor to Michaels of Oregon Co., Portland, Oreg.

Filed May 20, 1971, Ser. No. 145,222

Int. Cl. F41c 23/02

U.S. Cl. 42—85 **8 Claims**

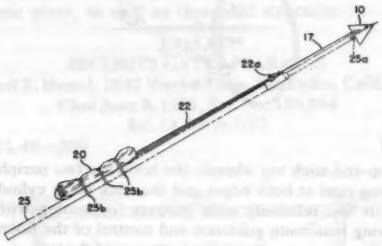


A device for mounting a sling swivel on the magazine tube of a firearm. The device includes a band notched on its outer surface to afford clearance for the adjacent barrel.

3,715,828
ANTI-SHARK DROGUE DART

Clarence S. Johnson and Arthur F. Langguth, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Mar. 24, 1971, Ser. No. 127,694
Int. Cl. A01k *81/00*
U.S. Cl. 43—6 4 Claims

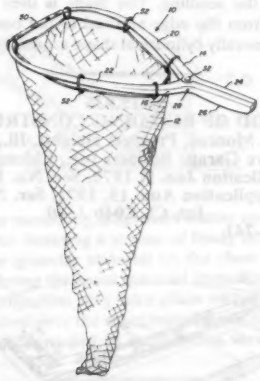


A sharpened, metallic dart secured to the riser lines of a small drogue chute is releasably mounted on the tip of a spear gunshaft with the drogue chute folded and elastically carried on the shaft. Upon embedding the dart in the shark's body via the launched spear shaft, and retracting the shaft, the drogue chute is pulled free and fills with water as the creature moves through the water. The entrained mass, captured by the chute, provides an asymmetrical drag to upset the hydrodynamic equilibrium of the shark and render him incapable of swimming in a coordinated manner and to, thusly, remove him as a danger to divers.

3,715,829
COLLAPSIBLE FISHING NET

Charles L. Hamilton, 1315 Maryland Avenue, Golden Valley, Minn.

Filed Dec. 10, 1970, Ser. No. 96,947
Int. Cl. A01k *77/00*
U.S. Cl. 43—12 4 Claims

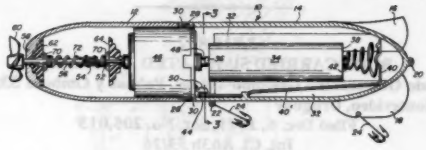


A collapsible fishing net formed of a pair of frame parts having handle and bowed frame portions which are pivotally connected to one another to permit separating and bringing together of the bowed portions with separation and bringing together of the handle portions for the purpose of opening and closing the net frame. A flexible interconnecting member attaches to the free extremities of the curved, bowed portion to complete the net frame and a net is suspended therefrom.

3,715,830
SELF-PROPELLED FISHING LURE

Benjamin W. Price, Nebo Route 1, Box 222, Marion, N.C.

Filed Feb. 25, 1971, Ser. No. 118,847
Int. Cl. A01k *85/06*
U.S. Cl. 43—26.2 4 Claims

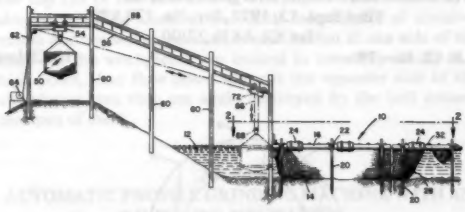


An artificial self-propelled fishing lure including a generally cylindrical body portion in which are carried an electric motor and a battery, the electric motor being connected to a shaft which extends through an end wall of the body portion to a connection with a driving propeller. The body portion is made of two parts which are rotatable with respect to one another about the longitudinal axis of the body portion, and the battery and electrical motor contacts are arranged to be engaged at a selected rotational positional of said body parts whereby the motor will operate the driving propeller. To prevent water from entering the body portion at the propeller shaft and reaching the motor, annular sealing members are fitted to the propeller shaft for engagement, respectively, with the interior wall surface at the end wall of the body portion and with the motor, and a biasing spring is arranged to urge these sealing members into engagement with the motor and the wall surface respectively. The shaft receiving openings in the sealing members are conical to provide a cavity between the shaft and the sealing members, and these cavities are filled with grease or the like which prevents water from flowing along the shaft. The cavities may be closed by cap members to retain the grease in the spaces, and the biasing spring may abut the cap members to hold them in place.

3,715,831
METHOD AND APPARATUS FOR HARVESTING FISH

Glenn E. Mason, 1134 Martingale Road, Jackson, Miss. 39206

Filed Aug. 30, 1971, Ser. No. 175,835
Int. Cl. A01k *75/00*
U.S. Cl. 43—4.5 11 Claims



Fish are harvested from shallow ponds, etc. having a regulatable water level by providing a net which is initially open at one end in a region which is several feet lower than the lowest portion of the remainder of the bed of the pond or lake so that the fish congregate in this region. Alternatively, the fish may also be lured into a net area by trailing fish food from the rear of a boat. Three sides of the net may be secured to a framework approximately at the water level, and a roller is disposed under the net at the other side of the structure at the water level. Movement of the roller within a rail assembly towards the

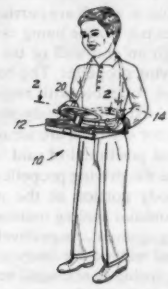
opposite side of the framework against the underside of the net progressively decreases the volume enclosed by the net and moves the fish towards the side of the apparatus nearest the shore line. The fish are herded into a conveying mechanism which conveys the fish to shore and deposits them in a suitable vehicle. The invention is applicable to the commercial production, processing and sale of fish.

3,715,832

BODY CARRIED SIMULATED AUTO TOY

Orazio Giovacchino Giacomo Torres, Palmas y Ombues 5354, Montevideo, Uruguay

Filed Dec. 6, 1971, Ser. No. 205,013
Int. Cl. A63h *33/26*
U.S. Cl. 46—1 B **5 Claims**



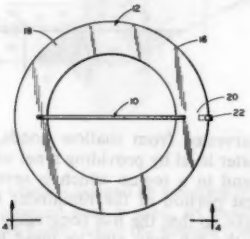
A child's toy simulating an automobile and comprising a horizontally oriented platform and front and side wall members is shown. The platform has a steering column and steering wheel projecting from it and dashboard instrumentation represented upon it. Likewise, the front and sidewalls have detail simulating the front and side walls of an automobile. In the preferred embodiment an enclosure is formed with a bottom wall and electrical circuitry is provided to operate directional signals and headlamps controlled by switches mounted on the platform.

3,715,833

GLIDER TOY

Robert J. Nickerson, Forest Park, and James N. Economos, Evergreen Park, both of Ill., assignors to Nickerson, Economos and Noonan, Evergreen Park, Ill.

Filed Sept. 13, 1971, Ser. No. 179,939
Int. Cl. A63h *27/00*
U.S. Cl. 46—79 **10 Claims**



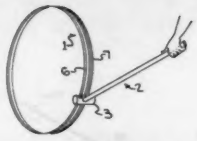
A glider toy is provided having at least one longitudinally extending planar fin and a planar annulus perpendicular to the fin. The annulus is bilaterally symmetrical with respect to its median longitudinal plane.

3,715,834

HOOP-AND-STICK TOY

Avion Paul Lewis Gelis, 638 Halley Avenue, Slidell, La.

Filed April 17, 1972, Ser. No. 244,640
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 **5 Claims**



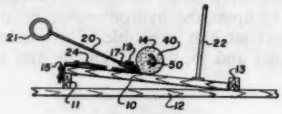
A hoop-and-stick toy wherein the hoop has two peripheral, upstanding rims at both edges and the stick has a cylindrical head with two relatively wide grooves for mating with the rims, giving maximum guidance and control of the hoop and yet allowing maximum flexibility in the use of the toy.

3,715,835

ENCAPSULATING TREE SEEDLING ROOT SYSTEMS

Norman R. Pelton, 12127 York Ave., Haney, B.C., Canada

Filed Oct. 2, 1970, Ser. No. 77,553
Int. Cl. A01g *9/10*
U.S. Cl. 47—58 **5 Claims**



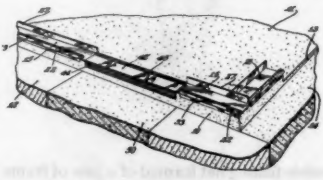
A device for encapsulating the roots of a tree seedling in a clay-like mud which comprises a flexible sheet secured at one edge to a base and having a blade extending along an opposite edge. A quantity of mud is placed on the sheet, the root system of the seedling is placed on the mud and then the sheet folded to bring the blade edge close to the opposite edge to fold the mud around the seedling. The blade is then slid along the sheet, away from the edge secured to the base, to form the mud into a generally cylindrical shape around the roots.

3,715,836

METHOD OF BUILDING CONSTRUCTION

Donald G. Monroe, Prospect Heights, Ill., assignor to Active Garage Builders Inc., Chicago, Ill.

Original application Jan. 9, 1970, Ser. No. 1,721. Divided and this application Aug. 19, 1971, Ser. No. 173,082
Int. Cl. E04b *1/40*
U.S. Cl. 52—741 **14 Claims**



A wall-carrying base plate is mounted on a poured, still plastic cementitious foundation by resting gauging means integral with one edge of the base plate on a form member to determine the elevation of the base plate. A depending flange on the base plate is engaged against an

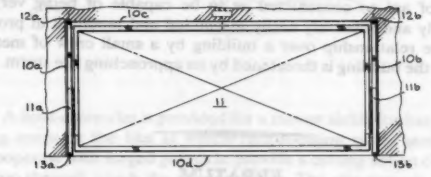
inner side of the form to determine the longitudinal placement of the base plate. The base plate is then supported by the form until the foundation material has set. Flange means on the base plate are embedded in the foundation material while still plastic to anchor the plate to the foundation. After the foundation material has set studs may be anchored on the base plate and siding connected to the gauging means as a starter and secured to the studs. Door framing is adapted to be associated with the base plate, as well as threshold structure.

3,715,837

SECURITY GATE APPARATUS

Michael T. Hamel, 1032 Werbel Place, San Pedro, Calif.

Filed June 8, 1971, Ser. No. 150,964
Int. Cl. E06b *3/32*
U.S. Cl. 49—380 **1 Claim**



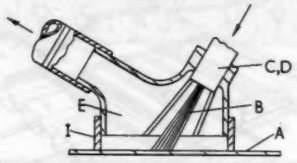
The present invention provides apparatus by means of which the various sections of a security gate can be easily and expeditiously raised and installed.

3,715,838

APPARATUS FOR CORRECTING MISPRINTED MATTER ON SHEET MATERIAL

Gideon Maurice Young, London; Harold Silman, Esher, and Eric John Hill, Slough, all of England, assignors to Vacu-Blast Limited, Slough, England

Filed March 2, 1971, Ser. No. 120,248
Claims priority, application Great Britain, March 6, 1970, 10,837/70; March 26, 1970, 14,684/70
Int. Cl. B24c *1/00*
U.S. Cl. 51—12 **5 Claims**



Apparatus for correcting misprinted matter on sheet material, the means for directing a stream of finely divided particulate abrasive or granular material on the sheet material and means for collecting the spent material immediately after use, in which the projection may take place within an enclosure which is positioned over the sheet material and to which a suction air flow is connected to remove the abrasive material after use.

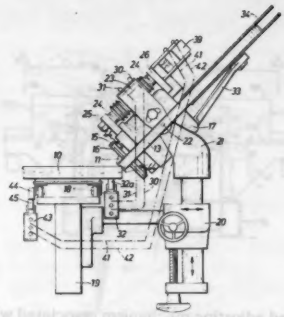
3,715,839

GRINDING DEVICE FOR THE RADIUSED CHAMFERING OF AN EDGE OF A WORKPIECE

Karl Heesemann, Friedenstrasse 54, 4970 Bad Oeyenhausen-Rehme, Germany

Filed Sept. 14, 1971, Ser. No. 180,356
Claims priority, application Austria, Sept. 15, 1970, 8361
Int. Cl. B24b *21/16*
U.S. Cl. 51—58 **7 Claims**

A grinding device for the radiused chamfering of an edge of a workpiece. The grinding device is characterized by a grinding belt progressively drawn from a spool and passed around a pressing surface on a pressing shoe which has a trapezoidal



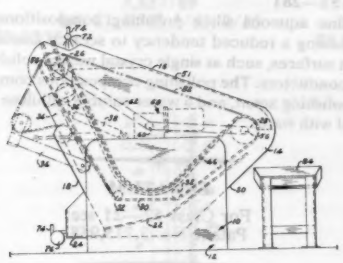
channel profile. A motor, with apparatus which produces an orbital movement for the pressing shoe, is included.

3,715,840

APPARATUS AND METHOD FOR FINISHING WORKPIECES

Richard L. Davidson, Sturgis, Mich., assignor to The Grav-I-Flo Corporation, St. Joseph County, Mich.

Filed Dec. 31, 1970, Ser. No. 103,266
Int. Cl. B24b *31/10*
U.S. Cl. 51—163 **17 Claims**



A tumbling machine having an endless belt arranged so that the top run of the belt defines with a pair of side walls a V-shaped tumbling chamber in which the mixture of abrasive media and the workpieces are loaded so that at one side of the chamber the workpieces are caused to travel upwardly to a high point, then flow down towards the opposite side of the chamber where they are again conveyed by the belt around the apex of the V.

3,715,841

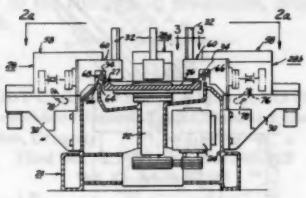
AUTOMATIC PROFILE GRINDING MACHINE WITH AN INDEXING MECHANISM

Oscar Schnellman, 8030 Zurich, Switzerland, and Henry Willy Stier, Dearborn Heights, Mich., assignors to Carmet Company, Pittsburgh, Pa.

Division of Ser. No. 751,879, Aug. 12, 1968, Pat. No. 3,587,192. This application April 28, 1971, Ser. No. 138,214
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.88 **5 Claims**

An automatic profile grinding machine with indexing mechanism especially for contour grinding of relatively small parts such as tool inserts, comprised of a grinding wheel, work stations arranged around said grinding wheel, universal work feeding mechanism associated with each work station, individual cam mechanisms for each work station to index the

grinding steps, electric and fluid pressure control mechanisms to control operation of the machine, work measuring



mechanism and adjusting mechanism associated with the measuring mechanism to compensate for wear or out of balance condition of the grinding wheel.

3,715,842

SILICA POLISHING COMPOSITIONS HAVING A REDUCED TENDENCY TO SCRATCH SILICON AND GERMANIUM SURFACES

Bruce Charles Tredinnick, Flemington, N.J.; James Richard Gambale, Media, Pa., and Paul Montgomery Dupree, Delaware Township, Hunterdon County, N.J., assignors to Tizon Chemical Corporation, Flemington, N.J.

Filed July 2, 1970, Ser. No. 52,094
Int. Cl. B24b *1/00*; C08h *17/12*
U.S. Cl. 51—281 **11 Claims**

Alkaline aqueous silica polishing compositions are provided, having a reduced tendency to scratch silicon and germanium surfaces, such as single crystal wafers polished for use in semiconductors. The polishing compositions comprise silica as the polishing agent, and a water-soluble cellulose ether, and are used with water.

ERRATUM

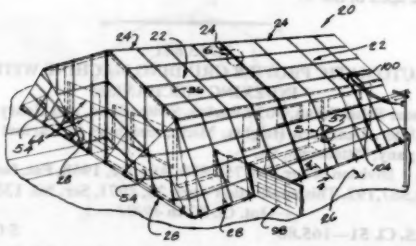
For Class 52—21 see:
Patent No. 3,715,958

3,715,843

FIRE PROTECTION APPARATUS FOR A BUILDING

Virgil R. Ballinger, P.O. Box 18948 Cimmaron Station, Los Angeles, Calif.

Filed Aug. 23, 1971, Ser. No. 174,026
Int. Cl. E04b *1/34*
U.S. Cl. 52—3 **16 Claims**



Fire-resistant apparatus for covering and enclosing a building for protecting it from airborne firebrands, or the like, produced by a high-velocity fire storm. The enclosing apparatus includes flexible, thin-sheet cover means of fire-resistant or fire-retardant material which is usually in the form of several panel portions adapted to be edge-joined by junction means to provide a composite cover of a desired size and shape for protecting a particular building and which is then pulled into place covering the building with edges of the cover means being firmly fastened together and effectively sealed substantially completely around the building to adjacent ground surface portions by edge-fastening means so that the high-velocity winds produced by a fire storm will be substantially excluded and so that the fire-retardant character of the cover means will prevent the building from catching fire as a result of burning embers or firebrands being blown by the approaching fire storm onto the building (of course, with the protective fire-retardant cover interposed therebetween). The multi-panel cover means and the edge-fastening means and auxiliary fastening strap means provided for attachment thereof are so constructed as to be capable of being very quickly and relatively easily assembled and mounted in protective relationship over a building by a small crew of men when the building is threatened by an approaching fire storm.

ERRATUM

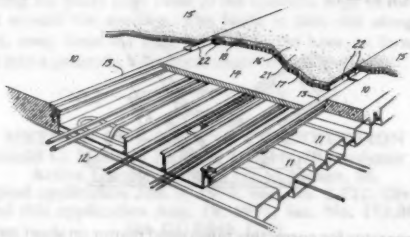
For Class 52—3 see:
Patent No. 3,715,843

3,715,844

FLOOR CONSTRUCTION INCLUDING CARPETED TRENCH HEADERS

Robert P. Breading, 714 Pine Street, Philadelphia, Pa.

Filed Feb. 24, 1971, Ser. No. 118,415
Int. Cl. E04b *5/48*
U.S. Cl. 52—221 **2 Claims**



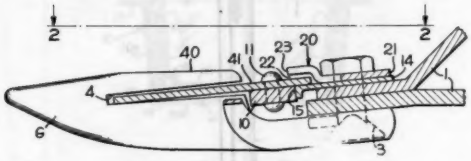
In a floor construction especially of the type which includes a floor slab and a trench header embedded in the floor slab and covered by a trench header cover, carpet on the floor slab and on the trench header cover has abutting edges where it meets. A carpet strip is secured to the abutting edges, having an elongated base underlying the carpet backing, and having an upstanding edge portion secured to the base and running along the edge of the carpet. The edge portion with the base makes an angle between 80° and 84°, preferably 83°. The edge portion at its top is below the top of the pile, and it extends above the carpet backing, locking the carpet at the edge. The carpet strip is secured to the carpet and to the floor slab or the trench header cover as the case may be. The back of the carpet strip preferably is of diminishing thickness at the edge remote from the upstanding edge portion.

3,715,845

MOWER SICKLE HOLD-DOWN MEANS

Benjamin A. Braunberger, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed May 12, 1972, Ser. No. 252,865
Int. Cl. A01d 55/06
U.S. Cl. 56—305 5 Claims



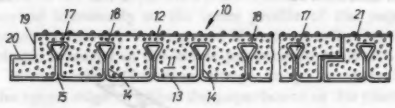
A hold-down clip is provided for a mower sickle for harvesting crops or the like in which reciprocating sickle sections cooperate with forged guards to provide a cutting action of the crop through which the mower moves. The clip extends over the rear portion only of the sickle sections and holds the sickle assembly down in position. The hold-down clip is out of the way and insures smooth flow of the crop over the sickle.

3,715,846

SELF-SUPPORTING INSULATING ELEMENT

Heinz Sullhofer, Niederrheinstrasse 158, 4000 Dusseldorf, Germany

Filed Sept. 8, 1970, Ser. No. 70,206
Int. Cl. E04c 1/30, 2/22
U.S. Cl. 52—309 1 Claim



A self-supporting insulating element for roofs and walls with an insulating core of hard foam material, especially polyurethane hard foam material, and with two cover layers one of which is formed by a reinforced metal sheet or reinforced web of synthetic material.

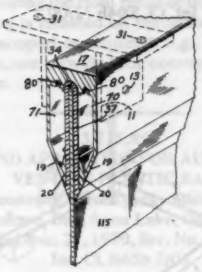
3,715,847

PANEL AND EXTRUSION COMBINATION

Albert E. Straus, Erie, Pa., assignor to General Partition Manufacturing, Erie, Pa.

Filed June 10, 1970, Ser. No. 45,179
Int. Cl. E04b 2/74
U.S. Cl. 52—400 1 Claim

A wall including an extrusion supported in a bracket member for attaching the extrusion to a wall. The extrusion having generally U shaped legs receiving a leg of the panel between them, the legs converging toward each other and terminating in spaced relation adapted to receive the edge of a relatively thin panel. A U shaped spacer member adapted to be supported over the edge of a thinner panel and inserted in the space, and screws extending through the bracket legs and into the legs of the extrusion. The extrusion forms a relatively rigid frame for a thin panel.

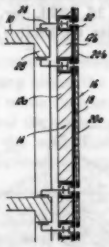


3,715,848

MULTIPLE LAYER OUTSIDE WALL OF A BUILDING OR THE LIKE

Paul Jordan, Zahringerplatz 2, Constance, Germany

Filed Apr. 15, 1970, Ser. No. 28,614
Claims priority, application Switzerland, Apr. 18, 1969, 5,857/69
Int. Cl. E04b 1/62, 2/88
U.S. Cl. 52—235 23 Claims

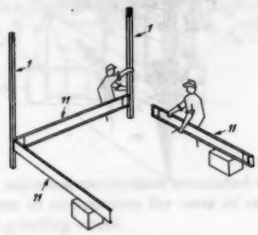


A multiple layer outer wall for a building or the like which embodies an outer wall layer portion and an inner wall layer portion as well as an insulation skin arranged between both of the aforementioned wall portions. This insulation skin is constructed as a membrane consisting of an elastic elongatable, tear resistant and thermally insulating material which at least is primarily covered both towards the outside of the building as well as toward the inside of the building by the respective outer and inner wall layer portions. Furthermore, the insulation membrane or skin is free of interruptions defining parting lines or separation joints or at least possesses less separation joints or parting lines than one of both wall layer portions, and additionally, the inner wall layer portion is assembled from a plurality of substantially rectangular wall elements which are laterally arranged adjacent one another with horizontal spacing and/or vertical spacing.

3,715,849
BUILDING CONSTUCTION

Marcel Rudolf Strassle, 9533 Kirchberg, Switzerland

Filed Oct. 1, 1970, Ser. No. 77,251
Claims priority, application Switzerland, Aug. 19, 1970, 12428/70
Int. Cl. E04h 12/00
U.S. Cl. 52—646 7 Claims

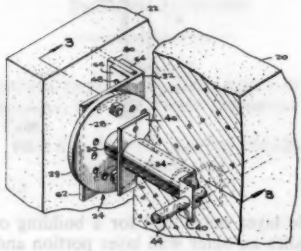


A building construction with hollow vertical pillars to which the required girders are directly connected. The pillars have a many-cornered, particularly a four-cornered, profile, and the side walls of the pillars are of corrugated shape, each side wall having alternating inner and outer peaks of trapezoidal shape. The outer peaks in the side walls are disposed on opposite sides of an inner peak, there being provided flanges which partially cover the space within the peaks. At each of the corners of the pillar there is provided an outwardly extending rib; at least on two side surfaces the pillar is provided with apertures on which to hang girders.

3,715,850
ADJUSTABLE MOUNTING DEVICE

James L. Chambers, 3615 Coker Street, Irving, Tex.

Filed Aug. 25, 1971, Ser. No. 174,631
Int. Cl. E04b 1/41
U.S. Cl. 52—701 17 Claims

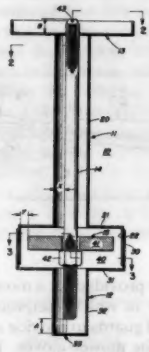


An adjustable mounting device is provided for supporting a decorative slab or the like from a building frame by means of an internal sleeve connected to the building frame with a table plate having a cantilever stem threadably received on the interior of the sleeve for inward and outward movement of the slab with respect to the frame. The table plate includes a plurality of aperture pairs to which an angle bracket is adjustably connected with the angle bracket being of L-shaped configuration and having a base plate and two parallel plates forming a slot in which a fixture plate on the slab is received; the pair of spaced plates defining the slot have a plurality of apertures through which a supporting bolt means extends into the fixture plate so that horizontal and vertical adjustment in any direction is provided for enabling connection of the fixture plate to the supporting building framework.

3,715,851
ANCHOR BOLT ASSEMBLY

Charles F. Bennett, 1325 Locust Ave., Bohemia, N.Y. 11716

Continuation of abandoned application Ser. No. 807,770, Mar. 13, 1969. This application May 7, 1971, Ser. No. 141,345
Int. Cl. E02d 5/74; E04b 1/38
U.S. Cl. 52—707 7 Claims

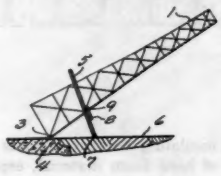


An anchor bolt assembly which is particularly useful for anchoring heavy machinery to bases or floors, such as a concrete floor, and which includes a sleeve member adapted to be embedded in the floor, and an anchor bolt or stud means positioned between restraining shoulders of the sleeve member.

3,715,852
METHOD OF ERECTING TOWER-LIKE STRUCTURE

Taro Koga; Taku Egusa, both of Hiroshima, and Yoshihiko Miyatani, Kamo-gun, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1970, Ser. No. 96,290
Int. Cl. E04b 1/00; E04g 1/00, 23/00
U.S. Cl. 52—745 10 Claims



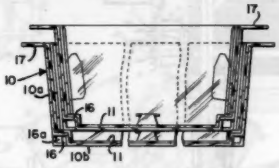
A method of works for erecting tower-like structures, characterized by the steps of assembling a tower-like structure as laid on the ground, coupling the lower end thereof onto the foundation with a horizontal pivotal shaft, pivotably mounting one ends of movable beams at an interval along an axis which is parallel to said pivotal shaft onto the ground, or onto a support structure or a side of said tower-like structure apart from said pivotal shaft, providing jack means on said movable beams so that said jack means may operate in their lengthwise direction and may move along said movable beams in their lengthwise direction while alternately engaging either end thereof fixedly with the movable beam, coupling one operating end of said jack means respectively onto a side of said tower-like structure or onto the ground or a support structure with a pivotal shaft which is parallel to said first pivotal shaft, and driving said jack means to erect said tower-like structure about said first pivotal shaft while either pushing or drawing.

3,715,853

BOILABLE BAKEABLE PACKAGE AND METHOD

Robert P. Bemiss, Hillsborough, Calif., assignor to Robalex Inc., San Francisco, Calif.

Filed Oct. 26, 1970, Ser. No. 83,704
Int. Cl. B65b *31/00*
U.S. Cl. 53—22 A 14 Claims



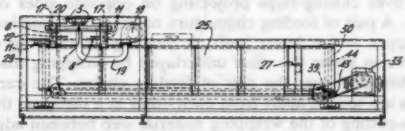
A laminated or multi-layer wall tray is provided which has a self-supporting outer layer or wall portion of paperboard which can be formed and handled as an independent self-supporting unit during manufacture of the laminated tray. A plastic liner is heat-vacuum formed into the paperboard tray or carton to provide a boilable, bakeable, liquid-tight, leak-proof lining for the tray which in its entirety is of a boilable or bakeable character, and to provide a strengthened structure of the composite tray of the outer paperboard supporting structure and inner plastic film liner in supporting structure. Both the liner and the paperboard are preferably made of a thinness or caliper of a dimension less than cqn be normally employed in such structures when used alone. At the bottom of the paperboard outer structure has certain formed indents around its bottom corner edge which provide resting portions or stops for nesting of the tapered trays to be handled as a stack, and also provide exit openings or vents for air from within the carton or tray at required positions to the outside during the thermo-vacuum forming of the liner. The method of fabricating or combining the components of such a tray comprises the steps of forming the outer paperboard structure or layer with the corners locked or secured together in self-supporting fashion to receive the plastic liner by thermo-vacuum forming process drawn inside of the self-supported paperboard outer structure to correspond identically to the inner profile of the paperboard container thereby locking and if desired, adhering the molten plastic material to the inside paperboard structure. A laterally horizontally extending flange may be provided around the upper edge of either the paperboard or the plastic, or both.

3,715,854

BAGS AND BAG-SUPPLYING APPARATUS

Alexander Steel Smith, 16, William Allen Lane, Lindfield, and Ernest Arthur Bailey, Magnolia, Station Road, Eynsford, both of England

Filed June 2, 1970, Ser. No. 42,666
Int. Cl. B65b *43/36, 67/12*
U.S. Cl. 53—29 7 Claims



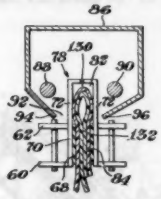
A bagging apparatus having means for advancing a bag in a flat or collapsed condition to a station where it can be opened for charging, means for retaining the bag in open position, mouth uppermost, and means for advancing the bag, when charged, and while retaining the charged bag in upright condition. Preferably air jet means are provided at the opening station for opening the leading bag of a spring-urged closely packed set of flat or collapsed bags on a holder means being provided for securing the front panel of that bag while the rear panel of said bag is retained on the holder. Conveyor means which can be stopped as required, e.g., at the opening and charging station, are provided for conveying the charged bag from that station.

3,715,855

METHOD AND APPARATUS FOR AUTOMATICALLY VENTING PLASTIC BAGS

William A. Armstrong, Brookpark, Ohio, assignor to Basic Packaging Systems, Inc., Avon Lake, Ohio

Filed Dec. 21, 1970, Ser. No. 99,780
Int. Cl. B65b *7/08*
U.S. Cl. 53—37 2 Claims



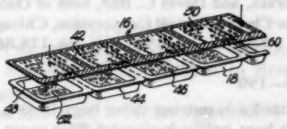
Method and apparatus for automatically closing plastic film bags while simultaneously venting the bag in a manner so that the bag is essentially "leak proof," but yet is able to breathe to avoid expansion of "pillowing" when stored at high temperature. The invention contemplates folding over the top portion of the bag, applying heating along the fold line sufficient to heat plastify the film and while cooperatively shielding short increments of the film; and thereafter squeezing and cooling the film to pressure set the seal. Each shielded increment forms an air vent to the above-noted quality.

3,715,856

PACKAGING METHOD

Mark Borel, Prairie Village, Kans., assignor to Jules Borel & Co., Kansas City, Mo.

Filed Aug. 19, 1971, Ser. No. 173,102
Int. Cl. B65b *7/28*
U.S. Cl. 53—41 5 Claims



A sealed container has a closure which includes a label attached to an outturned flange of the container by a peripheral band of pressure sensitive adhesive on the label such that the label is adapted to be peeled back at one of its corners to

dispense articles one at a time from the container and to be then pressed back into place until another article is to be dispensed, the closure being produced by a method which uses a backing sheet to present a path attached to the label by such adhesive and disposed within the confines of the band for protecting the articles against contact with the adhesive.

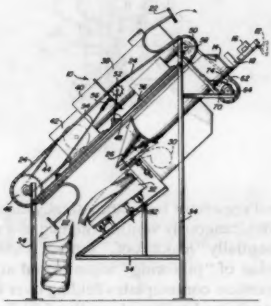
A single coating of the pressure sensitive adhesive is initially used to laminate the backing sheet with a label sheet and the patches are then preformed by die cutting the backing sheet. The labels may also be preformed by die cutting and/or by die perforating of the label sheet. The waste materials of the sheets are then removed, presenting the closures, each consisting of a patch still glued to the label and exposing only the pressure sensitive adhesive band on the label around the patch.

3,715,857

BAGEL BAGGING MACHINE

Daniel H. Fronczak, Buffalo, N.Y., assignor to Abels Bagels, Inc.

Filed Sept. 8, 1971, Ser. No. 178,619
Int. Cl. B65b *57/20, 43/36*
U.S. Cl. 53—62 **23 Claims**



An apparatus for packaging bagels and other articles, said apparatus comprising a solenoid operated gate and counter for permitting the passage of predetermined number of bagels into a sloped chute, a drive mechanism for advancing and pushing the bagels in a stacked manner beyond the chute and into an inflated bag for sealing and shipping. The bags are stacked upon a pair of tiers, one of which is automatically shifted into alignment with an inflation blower when the other bag supply becomes exhausted.

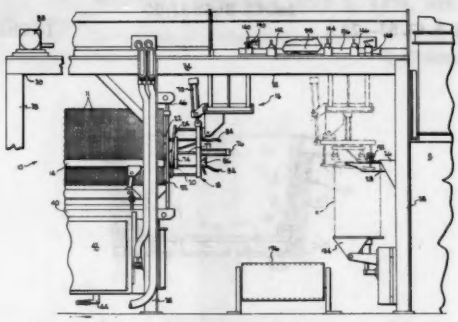
3,715,858

VALVE BAG PLACER

Will G. Durant, and David C. Ball, both of Ontario, Calif., assignors to Cherry-Burrell Corporation, Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 176,867
Int. Cl. B65b *43/26*
U.S. Cl. 53—190 **10 Claims**

Apparatus for removing valve bags from a magazine and placing the bags onto a horizontal filler spout for filling with flowable material. Handling means having a pair of grippers picks the forwardmost bag from the magazine and then pulls the bag valve open using an associated opening element. The bag valve is positively held open while the handling unit travels to the filler where the valve is inserted over the aligned spout. The apparatus is adapted to serve a pair of side-by-side fillers from a single magazine because lateral shifting of the handling means can be effected during its travel to align it with either filler spout. The operation is fully automatic and embodies a pneumatic control system which regulates each step of the bag-placing operation.

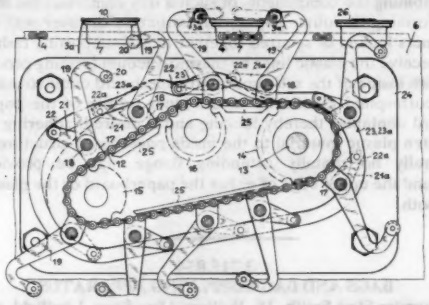


3,715,859

APPARATUS FOR WRAPPING UP OF DISC-SHAPED FOOD AND TABLE LUXURIES, AS CHEESE DISCS, CHOCOLATE BARS OR THE LIKE

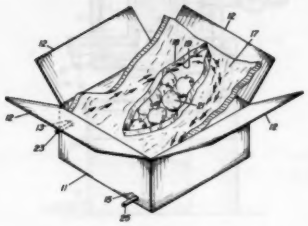
Gunter Reinecke, Wuppertal-Elberfeld, Germany, assignor to Benz & Hilgers GmbH, Dusseldorf, Germany

Filed Dec. 22, 1970, Ser. No. 100,688
Claims priority, application Germany, Jan. 2, 1970, P 20 00 023.1
Int. Cl. B65b *11/10, 49/10*
U.S. Cl. 53—209 **4 Claims**



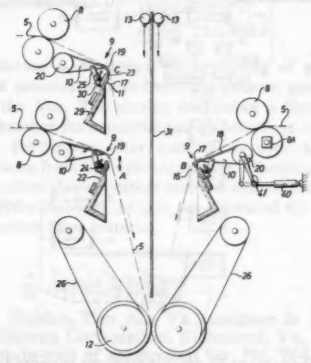
An apparatus for wrapping of disc-shaped food-and table-luxuries, as cheese discs, chocolate bars and the like, in foils of paper and/or metal and synthetic material, respectively, including a continuously rotating transportation band, which comprises means for feeding a wrapping material web and a plurality of discs to the transportation band, folding members fold over closing flaps projecting on opposite sides of the discs. A pair of feeding chains turn continuously, and include an upper and a lower path. A plurality of carrying strips receive in series the discs underlayed by wrapping material and bridging over the pair of feeding chains. The carrying strips are spaced apart from each other at a distance, that by cross-cutting of the wrapping material web between adjacent carrying strips two closing flaps are produced, and the passing of the folding members disposed below the pair of feeding chains and causing of the folding over of the closing flaps is made possible.

3,715,860
METHOD OF PRESERVING PERISHABLE PRODUCTS
Joseph J. Esty, 2033 Catalina Blvd., San Diego, Calif. 92107
Continuation of abandoned application Ser. No. 58,266, July 27, 1970, which is a division of application Ser. No. 645,968, June 14, 1967. This application July 23, 1971, Ser. No. 165,398
Int. Cl. B65b *31/04*
U.S. Cl. 53—22 B **2 Claims**



The method of packaging perishable products in a container and insuring preservation of the products while in the container, which method consists in permanently sealing the opening of the container after the product is packaged thereafter forcing an inert fluid to expel the air from the container through a port entry and exhaust, then sealing the port entry and exhaust while in the process of purging, thus trapping the inert fluid in the container.

3,715,861
IMPROVEMENTS IN A WRAPPING MACHINE FOR WRAPPING CYLINDRICAL OBJECTS
Stig Axel Odelberg, P. O. Box 259, 43080 Hovas, Sweden
Filed Sept. 11, 1970, Ser. No. 71,591
Int. Cl. B65b *11/04, 61/06;* **B26f** *3/02*
U.S. Cl. 53—211 **15 Claims**



A machine is disclosed for wrapping a web around a rotating cylindrical object. The web is fed from a supply roll through feed rolls and over a cutting means where the feed direction is changed. From this point the web with the assistance of further guiding means is passed onto the periphery of the rotating object. The cutting means comprise a web guide for bringing the web in contact with the cutting edge of a knife. In the cutting operation the supply and feed rolls are braked and the web is brought in contact with the knife edge, the portions of the web on each side of the severing line being free to move, in the feed direction, thereby assuring a clean cut without folding the upstream portion of the web and allowing the severed web portion free continuous passage to the periphery of the rotating object.

ERRATUM

For Class 52—319 see:
Patent No. 3,715,865

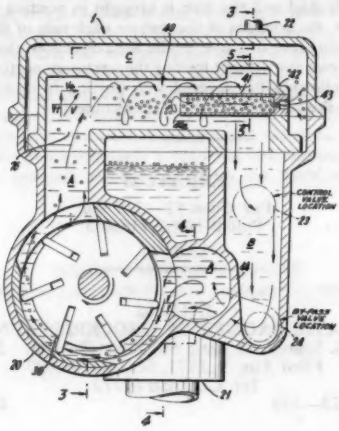
3,715,862
AUTOMATIC BAGGER OF GROCERIES SUNDRIES
Paul G. Schohl, 15 Einig St., Titusville, Fla. 32780
Filed Aug. 9, 1971, Ser. No. 95,897
Int. Cl. B65b *67/12*
U.S. Cl. 53—390 **2 Claims**

This invention is a novel way to improve and eliminate extra motion and lost time in the packaging of groceries and most of the items found in supermarkets and stores. After observing for many years the old manner of packaging the customers' items, it was noted that the cashier must pick up each item to price, and she either sets it back down or gives it a toss to the far end of the checkout counter. Why not be able to bag at the same time, as you check out? This invention operates on a small rugged 110 electrical system. Simply plug in anywhere. The machine will fit under any conventional grocery counter and be out of the way. It can be used at all times or it can be by-passed.

3,715,863
COMPACT PUMP/AIR SEPARATOR APPARATUS
Paul Zanoni, Muskegon, Mich., assignor to Bennett Pump Inc., Muskegon, Mich.
Filed March 26, 1971, Ser. No. 128,291
Int. Cl. B01d *19/00*
U.S. Cl. 55—204 **9 Claims**

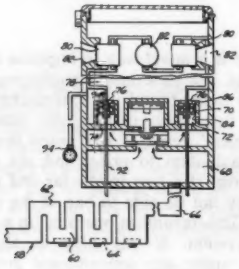
A pump/air separator apparatus for use in dispensing gasoline includes an air separator of the cyclone type in which air and a low percentage of gasoline are removed from the pressurized gasoline by the air separator, with the air being vented to the atmosphere and the gasoline being returned to the suction side of the pump. Simultaneously pure gasoline is

delivered from the air separator through an outlet valve to a meter and then to the nozzle dispenser, and any excess of such



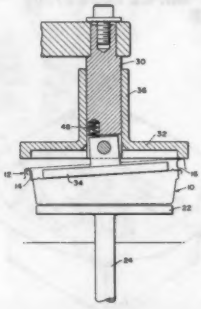
pure gasoline is by-passed back to the suction side of the pump.

3,715,864
SMOG PULVERIZING MACHINE
Eugene Rushin, 3988 Sheridan St., Detroit, Mich.
Filed May 13, 1971, Ser. No. 143,000
Int. Cl. B01d *50/00*
U.S. Cl. 55—213 **6 Claims**



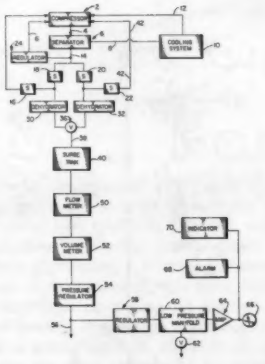
This invention relates to apparatus for diluting and dispersing smoke from a furnace. It comprises the drawing of smoke from a furnace or other smoke producing apparatus by pumps into mixture with a flow of warm air. The resulting mixture is serially pumped into a first chamber. Float valves relieve this first chamber into a second or high pressure chamber. When these valves are sufficiently pressed downwardly by pressure in the second chamber, solenoid actuated valves in the second chamber are opened to relieve the mixture at relatively high pressure and velocity into the outside atmosphere. The solenoid actuated exit valves are provided with apparatus to remain in a locked open position until the float chambers rise sufficiently to deactuate this locking apparatus.

3,715,865
CAPPING DEVICE FOR CONTAINERS
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Nov. 5, 1970, Ser. No. 87,179
Int. Cl. B65b *7/28*
U.S. Cl. 53—319 **12 Claims**



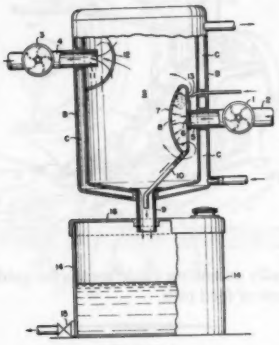
A mechanism for seating lids on containers including as one embodiment a vertically movable container support and a capping head having a plate and an inner disc pivotally carried on a post above the support. As the container with a lid resting on its rim moves upwardly, the plate is carried upwardly on the lid and the disc seats one side of the lid and then seats the other side on the container, thereby minimizing distortion of the lid and container, and allowing air to escape from the container. In another embodiment the container remains stationary, and the pivotally mounted disc without the plate is vertically movable toward and away from the container and the lid.

3,715,866
DRY AIR SYSTEM
Edward S. Chatlos, Morristown, Paul G. K. Schroeder, Sparta, and Clarence O. Prinkey, Caldwell, N.J., assignors to Chatlos Systems, Inc., Hanover, N.J.
Filed Apr. 30, 1970, Ser. No. 33,288
Int. Cl. B01d *53/04*
U.S. Cl. 55—179 **2 Claims**



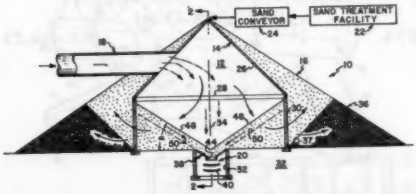
An improvement in dry air systems is provided by utilizing flow rate and volume indicators on the output side of a surge tank so as to minimize pulsating action during transition from one de-hydration tower to the other in the drying portion of the system. Moreover, humidity indication means are incorporated to signal the differential trend in condition as well as an alarm condition.

3,715,867
APPARATUS FOR PURIFYING GASES
Katashi Aoi, 840 Juniso, Kamakura, Japan
Filed Nov. 30, 1970, Ser. No. 93,639
Int. Cl. B01f *3/04*
U.S. Cl. 55—222 4 Claims



A gas separating chamber is defined in a box or vessel which has a gas inlet, a gas outlet and an exhaust tube. An adiabatic expansion chamber for separation and removal of toxic components in gases is positioned within the gas separating chamber and a cooling means for reducing the temperature of gases is disposed inside or outside of the vessel.

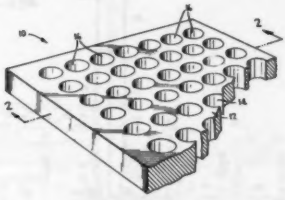
3,715,868
APPARATUS FOR POLLUTION CONTORL OF FURNACE GASES
Charles P. Biasi, 74 Braman Road, Waterford, Conn.
Filed Nov. 23, 1970, Ser. No. 91,763
Int. Cl. B01d *23/16*
U.S. Cl. 55—315 10 Claims



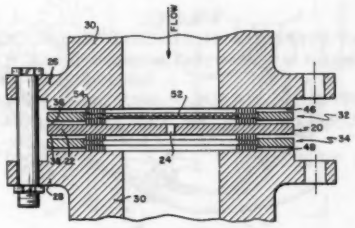
A filter device is disclosed for removing of particulate material and reactive vapors from the exhaust gases from a furnace or the like. The device comprises a flow velocity reduction chamber for separating particles above a predetermined size. Particulate filter material is used to remove smaller particles from the exhaust stream. Chemicals may be added to the filter device, either into the chamber or into the particulate filter material. Means are provided for removing fouled particulate filter material.

3,715,869
FILTER
Herbert K. Holden, Bon Air, Va., assignor to American Filtrona Corporation, Richmond, Va.
Continuation-in-part of application Ser. No. 764,788, Oct. 3, 1968, now Patent No. 3,611,678. This application Mar. 8, 1971, Ser. No. 121,989
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 15 Claims

A bonded activated carbon filter and a method for making the same are disclosed. The filter contains activated carbon and a thermosetting or thermoplastic resin binder, and is a self-contained disposable filter having voids in sufficient amount to provide a pressure drop of about 0 to 0.5 inch of water at a face velocity of up to approximately 450 feet per minute. The method includes mixing the dry ingredients and sufficient water, charging to a mold, applying sufficient pressure, discharging the green mold piece and curing the resulting filter. By the use of granular activated carbon a larger filled face area/void ratio may be provided for certain applications since the granular material provides some permeability through the filled face area while the voids permit control of the pressure drop characteristic of the filter.



3,715,870
ORIFICE AND FILTER ASSEMBLY
Lawrence L. Guzick, 10322 Royal Road, Silver Spring, Md. 20903
Filed June 29, 1970, Ser. No. 50,501
Int. Cl. B01d *35/02*
U.S. Cl. 55—466 2 Claims

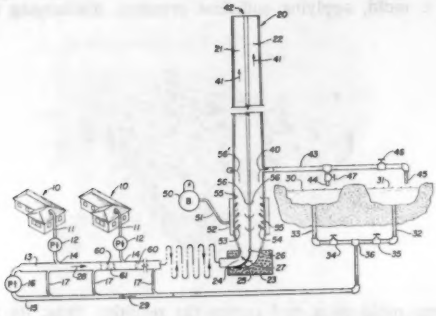


A plate member containing an orifice for use in a pipeline of steam powered equipment to control the drainage of steam condensate with a minimum loss of steam. A filtering element is located adjacent the plate member in the pipeline to prevent deleterious material from clogging the orifice.

3,715,871
SMOG ELIMINATOR
Benjamin Jones, and Rosetta M. Jones, both of 711 N. Columbia St., Brazil, Ind.
Filed May 26, 1971, Ser. No. 147,039
Int. Cl. B01d *47/02*
U.S. Cl. 55—227 10 Claims

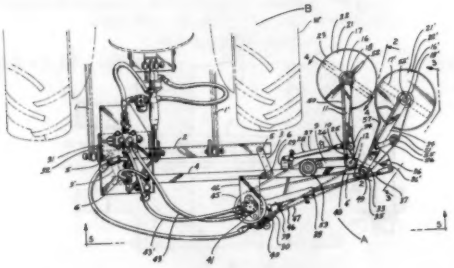
A smog eliminator for removing smoke and gas from the by-products of combustible materials. An underground pipe system has pressurized water flowing therethrough mixing with the smoke and gas produced by dwelling house heaters or factories or anything creating gas or smoke. The smoke and gas is thoroughly mixed with the water in the underground pipe system and is then routed to a vertical chimney having nozzles emitting upwardly directed steam. The pressurized water flows from the chimney carrying therewith dissolved gases and particulate matter. The undissolved gas passes out

of the chimney into the atmosphere. Two bodies of water are utilized for receiving the unclean water from the chimney and



for circulating fresh water back to the underground pipe system.

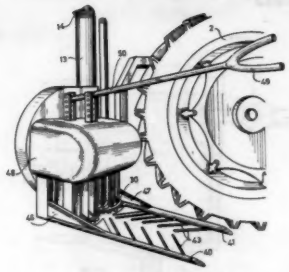
3,715,872
MOWING APPARATUS
Philip Thompson, Jr., 16 Sunset Trail, Austin, Tex.
Filed July 19, 1971, Ser. No. 163,598
Int. Cl. A01d *35/26*
U.S. Cl. 56—10.4 **8 Claims**



A mowing apparatus adapted for mounted disposition upon a vehicle comprising a mounting arm, and first and second cutter blade-carrying arms presented in generally side-by-side relationship with resilient means for urging said arms toward each other; there being blade guards carried on said first and second arms. Said resilient means are yieldable upon impact of said guards with an upright so as to maintain said guards in contact with the upright while moving relatively therepast to present said blades for trimming grass and the like adjacent to said upright.

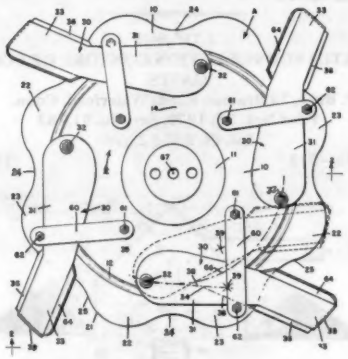
3,715,873
HARVESTING AND ENSILAGE CUTTING APPARATUS
Petrus Wilhelmus Zweegers, Geldrop, Nieuwendijk, 46, Netherlands
Filed Nov. 23, 1971, Ser. No. 201,296
Claims priority, application Netherlands, Nov. 23, 1970, 7017081; March 3, 1971, 7102855; Sept. 7, 1971, 7112316
Int. Cl. A01d *55/26, 49/00*
U.S. Cl. 56—13.4 **26 Claims**

Harvesting and ensilage cutting apparatus, comprising a chopper rotor in a housing with a front inlet opening, a pair of cooperating feed rolls mounted for counterrotation about substantially vertical axes closely in advance of said front inlet opening, stalk cutting means below said pair of feed rolls and a



pair of forwardly extending guide means for guiding row crop toward said pair of feed rolls.

3,715,874
LAWN MOWER CUTTERS
Chester O. Goserud, 3205 Woodbridge Street, St. Paul, Minn.
Filed Oct. 1, 1971, Ser. No. 185,541
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **3 Claims**

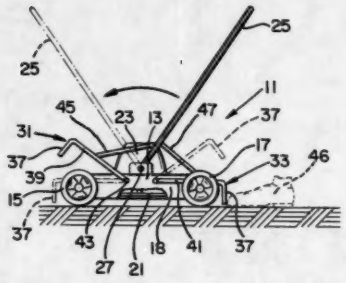


A lawn mower cutter having a rotatable body and a plurality of cutting units with sharpened edges and object striking ends pivoted thereto and adapted to swing outwardly by centrifugal force, said units being adapted to swing inwardly of the peripheral edge of said body to protective areas of the body where the cutting edges of said units are within the protective areas of the body, said body having marginal undulating edges defining the protective areas and forming projections serving to engage objects and shift the same outwardly.

3,715,875
LAWN MOWER SAFETY GUARD
William S. Brucker, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Feb. 9, 1972, Ser. No. 225,209
Int. Cl. A01d *67/00, 55/18*
U.S. Cl. 56—320.1 **2 Claims**

A rotary lawn mower comprising a deck housing supported by wheels for movement along the ground. A motor is supported upon the deck housing and drives rotary blade means

disposed therebeneath. An upstanding handle is connected to the deck housing for control and manipulation of the mower. The handle is pivotally mounted upon the deck of flipover movement to facilitate opposite directional, longitudinal movement of the mower without having to turn it around.



Novel guard means is provided on the mower to prevent an operator's foot from accidentally coming into contact with the rotary blade means. The guard means is constructed to so protect the operator's feet in both longitudinal directions of movement of the mower, and to minimize interference with efficient grass cutting.

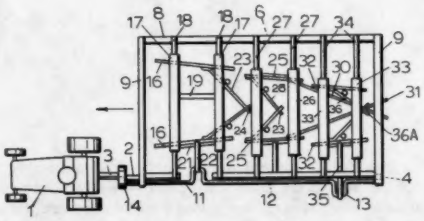
ERRATUM

For Class 56—305 see:
Patent No. 3,715,845

3,715,876
GRAPE HARVESTER AND FLEXIBLE BAR

Philip B. McCord, 9845 East Lake Road, R.D. 1, North East, Pa.

Filed June 18, 1971, Ser. No. 154,445
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **4 Claims**

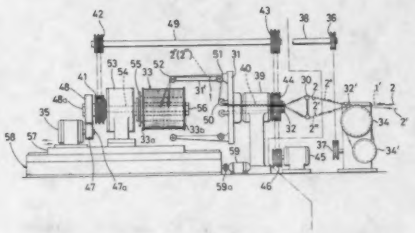


The invention disclosed herein is an improved combination grape harvester and flexible bar. The frame of the mobile harvester travels along opposite sides of a row of grape vines which are supported on a trellis wire. The machine has groups of generally horizontal flexible bars extending lengthwise of the rows and moves horizontally back and forth crosswise of the row, vertically positioned to engage and shake the top, bottom and intermediate parts of the fruit bearing vines. Each of the flexible bars has a loop formed at an intermediate point of them so that the bar has additional flexibility and is prevented from breaking and is given an exceeding amount of flexibility.

3,715,877
COMMUNICATION CABLE

Hisateru Akachi, Tokyo, Japan, assignor to Oki Densen Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Oct. 7, 1970, Ser. No. 78,870
Claims priority, application Japan, Oct. 27, 1969, 44/85933; Oct. 27, 1969, 44/85934
Int. Cl. H01b *13/04, 11/04*
U.S. Cl. 57—156 **36 Claims**

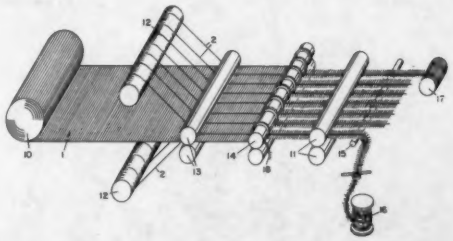


A communication cable, and the method and apparatus therefore, made up of twisted strands of laid component conductors, wherein the component conductors are laid at pitches varying stepwise throughout their lengths and/or the strands are twisted at pitches varying stepwise throughout their lengths, whereby the production speed and efficiency are drastically increased as compared to conventional communication cable production techniques.

3,715,878
PROCESS FOR MAKING CHENILLE-TYPE YARN

Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 821,414, May 2, 1969. This application March 12, 1971, Ser. No. 123,503
Int. Cl. D02g *3/42*
U.S. Cl. 57—156 **5 Claims**



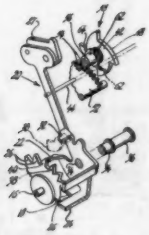
Novel decorative yarns are prepared by laying up a nonwoven web comprising a series of parallel warp yarns bonded to filling yarns and thereafter separating the web into strips along lines substantially parallel to the warp yarns and twisting the resultant product to form chenille-type yarns. The filling yarns can be either continuous filament or random laid staple fibers. Separation of the web into strips is accomplished by slitting in the case of continuous filament filling yarns or by simple mechanical pulling apart in the case where staple fibers are used in the filling.

3,715,879

INTERMITTENTLY REPEATING ALARM MECHANISM

Edward F. Cielaszyk, Oglesby, Ill., assignor to General Time Corporation, Mesa, Ariz.

Filed April 5, 1972, Ser. No. 241,285
Int. Cl. G04b *23/10*
U.S. Cl. 58—18 4 Claims



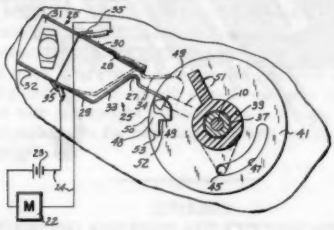
A spring wound alarm clock, an alarm mechanism which permits an intermittent sounding of the alarm. Such mechanism comprises a star wheel which causes the alarm clapper to repeatedly oscillate and strike the bell surface to sound the alarm. In keeping with the present invention, at least one tooth of the star wheel is deformed from the others and serves to arrest the clapper and thereby silence the alarm after a very brief alarm-sounding period; not more than a single revolution of the star wheel. Following about two minutes of silence, a continuously rotating cam wheel which is in engagement with a projection on the clapper member effectively removes the clapper from the star wheel arresting position and thereby frees the mechanism for a second brief alarm-sounding period. The above intermittent alarm sequence of very brief alarm-sounding will continue up to approximately 50 minutes, or until the alarm mechanism is manually disabled.

3,715,880

BATTERY CLOCK WIND DEVICE

John Roger Simons, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 7, 1971, Ser. No. 150,520
Int. Cl. G04c *1/00*
U.S. Cl. 58—41 11 Claims



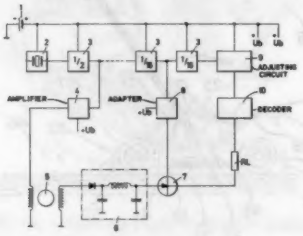
An electromechanical rewind device for clock mechanism, in which a rewind motor switch is closed by operating means driven by the spring-powered drive shaft, and means on the rewind gear driven by the motor operates after a predetermined interval of motor operation to drive the switch-operating means in overrun relation to the shaft to release the switch which thus opens and stops the motor.

3,715,881

DISPLAY CONTROL DEVICE FOR TIMEPIECES

Pierre Girard, Bienne, Switzerland, assignor to Manufacture des Montres Rolex S. A. Bienne, Bienne, Switzerland

Filed May 11, 1971, Ser. No. 142,309
Claims priority, application Switzerland, May 11, 1970, 6974/70
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 R 8 Claims



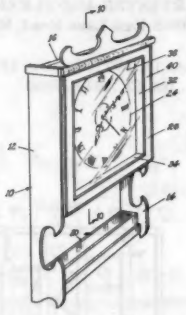
The display is controlled by a device supplied by the same battery as the timing base of the timepiece. The signals produced by the timing base are then sent to a voltage elevating device through an amplifier. Afterwards they are rectified, hacked and pulsed to a liquid crystal cell having an electrooptic effect and displaying the time indications.

3,715,882

CLOCK CABINET

Harold Herman Ohde, 522 Southwood Ave., Columbus, Ohio

Filed July 16, 1971, Ser. No. 163,295
Int. Cl. G04b *37/00*
U.S. Cl. 58—53 7 Claims



A clock having an easily and quickly removable front panel to which the clock face and clock drive mechanism are mounted. Attractive crown, collar and side ornamentation on the cabinet is removably mounted and conveniently interchangeable with different ornamentation.

3,715,883

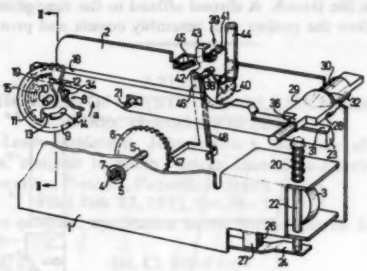
SYNCHRONOUS ALARM CLOCK

Walter Trimpler, Nurnberg, Germany, assignor to DIEHL, Nurnberg, Germany

Filed Dec. 16, 1970, Ser. No. 98,638
Claims priority, application Germany, Dec. 27, 1969, G 69 50 134.4
Int. Cl. G04b *13/00*
U.S. Cl. 58—21.15 12 Claims

A alarm clock which is driven by an alternating current synchronous motor and has an alarm device in the form of an

oscillator which is adapted to be released to the influence of an alternating magnetic field derived from the field structure of the motor. The alarm device includes manual turn off and also includes a manual arrangement for interrupting the alarm



device for a certain period of time while sounding. The alarm device, unless permanently shut off will become effective at the same time each day and will sound for a predetermined interval unless turned off.

3,715,884

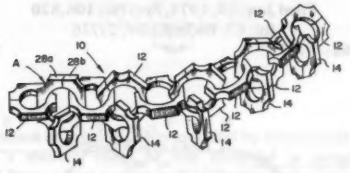
DRUM SCRAPING CHAIN

Murray A. Sanders, Woodside, N.Y., assignor to Allen-Stevens Drums Accessories Corp., South Plainfield, N.J.

Filed Aug. 31, 1970, Ser. No. 68,404

Int. Cl. F16g *13/18*

U.S. Cl. 59—78 **9 Claims**



A chain for scouring the inside surfaces of a drum. The chain has a plurality of running links, these being links which are secured to each other in seriation. Cross-links are attached to mutually spaced (not directly interconnected) running links to increase chain flexibility. All the links have the same configuration. Indentations are provided at each corner between adjacent sides of the link. All the links have hard surfaces, for example being case hardened or nitrided.

3,715,885

HEAT VAPOR DIFFERENTIAL ENGINE

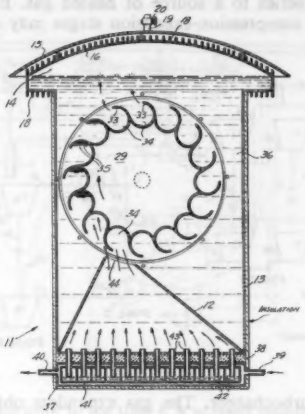
George O. Schur, 3775 S.W. 108th Avenue, Miama, Fla.

Filed Nov. 12, 1971, Ser. No. 198,161

Int. Cl. F01k *25/10*; F03g *7/02*, *7/00*

U.S. Cl. 60—25 **12 Claims**

A heat engine consisting of a hermetically vapor vacuum sealed container and a heat-transfer fluid circuit, the fluid circuit including a heat source such as a solar heat collector. The engine employs as a working fluid a liquid with a low boiling point in the container, the heat transfer circuit passing through the lower portion of the container so that heat is conducted therefrom to the working fluid, causing bubbles to be generated therein. The bubbles flow upwardly and drive a turbine assembly mounted in the upper portion of the container. The turbine assembly is magnetically coupled to an external load device. The top of the container consists of a condenser



exposed to ambient temperature wherein the bubbles are condensed and returned to a liquid state.

3,715,886

GAS TURBINE INSTALLATION WITH A CENTRIFUGAL FLUID VANES COMPRESSOR

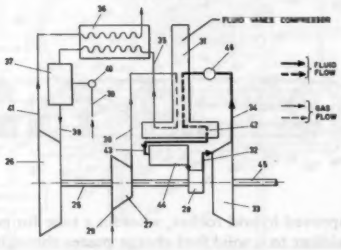
Pieter Van Staveren, 19, Wilhelminasingle, Pijnacker, Netherlands

Filed April 7, 1971, Ser. No. 132,106

Claims priority, application Netherlands, April 7, 1970, 70/04991

Int. Cl. F02c *3/02*

U.S. Cl. 60—39.18 R **1 Claim**



A gas turbine installation comprising a gas turbine the shaft of which is coupled with a compressor and a fluid pump, which drives a fluid turbine.

The improvement consists in that in the gas turbine cycle a centrifugal fluid vanes compressor is incorporated, which on the one hand is connected to the compressor for the supply of gas and on the other hand is connected to the exhaust of the hydraulic turbine for the supply of the fluid forming the fluid vanes, which fluid also drives the rotor.

The efficiency of the installation and its velocity in response to changes in load are considerably improved.

3,715,887

MULTIPLE STAGE GAS COMPRESSION APPARATUS AND METHOD

David M. Weatherly and Desmond J. Byrne, Atlanta, Ga., assignors to The D. M. Weatherly Company, Atlanta, Ga.

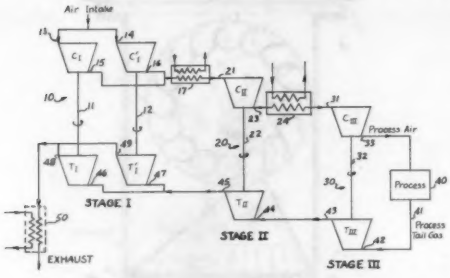
Filed Sept. 10, 1971, Ser. No. 179,436

Int. Cl. F01k *3/18*

U.S. Cl. 60—59 T **10 Claims**

Gas compression apparatus and method in which gas compression occurs in a series circuit including two or

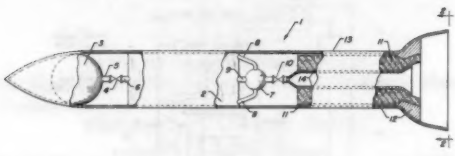
more gas compression stages in which each of the compression stages is independently driven by a corresponding number of separate gas expansion stages which are connected in series to a source of heated gas. Each of the individual compression-expansion stages may comprise a separate turbocharger. The gas expanders obtain power from a source of hot gas applied in series circuit commencing with the expander driving the compression stage having the greatest discharge pressure and ending with the expander driving the compression stage having the lowest discharge pressure.



3,715,888
HYBRID ROCKET

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Co., Des Plaines, Ill.

Filed Nov. 26, 1969, Ser. No. 880,286
Int. Cl. F02k 9/06
U.S. Cl. 60—251 5 Claims



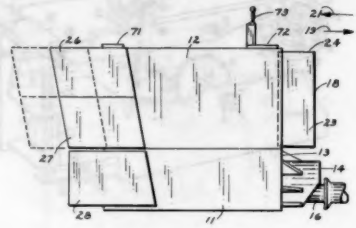
An improved hybrid rocket, wherein a tube for conducting liquid oxidizer to a solid fuel charge passes through the solid fuel charge and is constructed so as to structurally disintegrate when subjected to the heat produced by the reaction of the solid fuel and liquid oxidizer. Disintegration of the tube proceeds at approximately the same axial rate as does consumption of the solid fuel during operation of the rocket. As a result, the liquid oxidizer is continually supplied to the appropriate location in the solid fuel charge so as to increase the uniformity and thoroughness of burning. The burn time of the rocket may thereby be extended and the thrust may be varied by utilizing a tube of varied cross section and varied wall thickness.

3,715,889
TRENCH SHORING MACHINE

Donald Bixler, 9520 Copley Dr., Indianapolis, Ind., and Robert H. Corey, 6938 Tousley Dr., Indianapolis, Ind.

Filed Dec. 3, 1971, Ser. No. 204,437
Int. Cl. E21d 5/12
U.S. Cl. 61—41 A 21 Claims

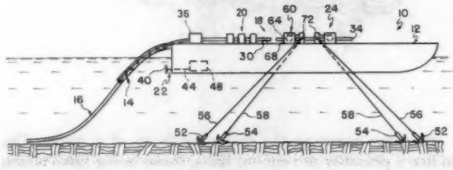
Upper and lower generally rectangular boxes, affixed together, are disposed in a trench to provide a safe working space for workmen installing underground pipe. Probing side plates at the front of the boxes are movable forward and backwards hydraulically to control collapse of the trench wall ahead of the box assembly. An upstanding pusher wall at the rear end of the upper box is hydraulically drivable rearwardly to push against fill in the trench behind the box assembly whereby, upon compaction, the box assembly is pushed forward in the trench. A shroud affixed to the rear of the lower box below the pusher wall assembly covers and protects the pipe from separation as the box assembly is moved forward. The box side walls are tapered inwardly toward the rear to minimize soil adhesion resistance to forward movement of the box assembly. Hydraulic lifting pads under the assembly assist in steering and maintenance of proper leveling and grade of the box assembly. Balancing and phasing means are provided in the hydraulic system. A built-in greasing system is employed.



3,715,890
MOORING SYSTEM FOR PIPELAYING BARGES

Carl G. Langner, Houston, Tex., assignor to Shell Oil Co., New York, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,820
Int. Cl. B63b 35/04, 21/16
U.S. Cl. 61—72.3 8 Claims



A pipelaying barge particularly adapted for use in intermediate water depths is disclosed. The barge has propellers which apply forward thrust to the barge, and a tension brake which grips the pipe and provides controlled relative motion between the pipe and the barge. Forward movement of the barge and tension in the pipe are controlled by the combined action of these propellers and the tension brake. Lateral movement of the barge is controlled by anchor systems operating off each side of the barge.

3,715,891
POULTRY FREEZING PROCESS

Walter Harper Martin, San Antonio, Tex., assignor to Refrigeration Engineering Corporation, San Antonio, Tex.

Filed Dec. 11, 1970, Ser. No. 97,298
Int. Cl. F25d 13/06
U.S. Cl. 62—63 4 Claims

A poultry freezing process by means of which the natural moisture within poultry products is crystallized for preserva-

tion, the process being carried out by moving the products through a moisture-laden chamber maintained at a temperature of approximately 15° to 25°F. and thereafter passing air over the poultry products in the chamber at a low velocity for a period of from about 30 to 90 minutes thereby reducing the temperature of the poultry products to approximately 18° to 28°F. throughout.

3,715,892

PURIFICATION OF CRYSTALLIZABLE MATERIAL BY DIRECTIONAL FREEZING

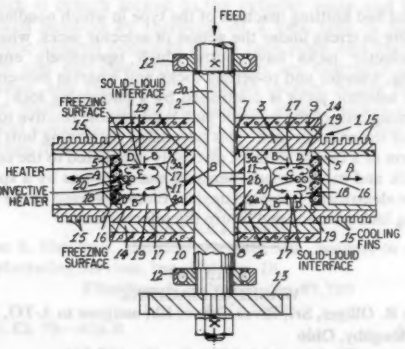
Ernest Leslie Anderson, Johannesburg, Republic of South Africa, assignor to South African Inventions Development Corporation, Pretoria, Republic of South Africa

Filed Feb. 22, 1971, Ser. No. 117,622

Claims priority, application South Africa, March 5, 1970, 70/1496

Int. Cl. B01d 9/04

U.S. Cl. 62—58 **9 Claims**



Purification of crystallizable material by directional freezing wherein a molten mass of the material is progressively solidified from a first region in the mass to a second region in the mass; the material is rotated during solidification to subject the material to centrifugal force which is at least equal to the force of gravity, preferably at least ten times the force of gravity, and which acts in a direction transversely to the direction of solidification; and heat is introduced into the molten material to induce convective flow of molten material past the advancing solid-liquid interface in a direction transversely to the direction of solidification, preferably in the same direction as that in which the centrifugal force acts.

3,715,893

TEMPERATURE CONTROL SYSTEM FOR FREEZERS

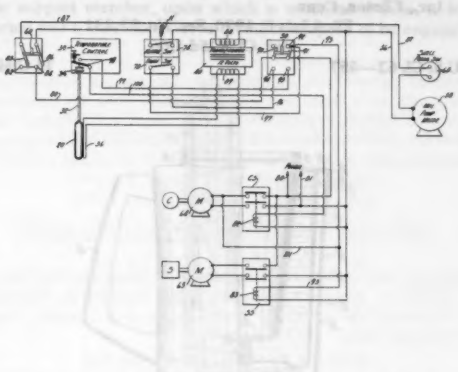
Bernfried M. Werner, Pompano Beach, Fla., assignor to Louis A. M. Phelan, Pompano Beach, Fla.

Filed March 25, 1971, Ser. No. 127,886

Int. Cl. F25c 7/10

U.S. Cl. 62—135 **2 Claims**

A temperature control system for freezer mechanism of the continuous freezing type and in which various combinations of ingredients are fed into a freezing chamber and frozen. A scraper slowly rotates over the inner surface of the chamber to remove the frozen mix from the surface of the cylinder. The freezing chamber is pressurized and the product forced out of a serving valve at one end of the freezer and the temperature of the product is sensed and is used to control the refrigeration means. A heat anticipator is also energized during the draw and heats the sensing means so that the need for refrigeration



is anticipated prior to the time it is actually required, thereby eliminating any time lag in supplying refrigeration.

3,715,894

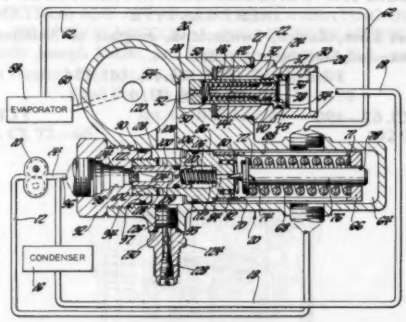
AIR CONDITIONING BYPASS CONTROL

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

Filed Sept. 16, 1971, Ser. No. 181,070

Int. Cl. F25b 41/00

U.S. Cl. 62—196 **3 Claims**



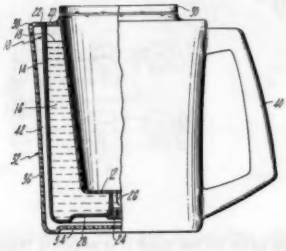
A vapor compression air conditioning system including defrost control valve means between the compressor outlet and the evaporator in bypass relationship to the condenser and expansion valve for supplying hot refrigerant directly to the evaporator for defrosting in response to a predetermined low temperature of refrigerant in the evaporator which corresponds to frost accumulation. The control valve includes a piston reciprocal in a housing and having one end of the piston exposed to the compressor outlet pressure and the second end exposed to a refrigerant pressure within a variable volume control chamber between the piston and the housing. A small diameter bleed port extending through the piston equalizes the pressure forces acting on the ends of the piston to normally maintain the piston in a closed position. When a bimetal spring in an adjacent enclosure senses a low refrigerant temperature which corresponds to frost accumulation on the evaporator, a passage between the control chamber and the enclosure is opened for rapidly reducing pressure in the control chamber and causing the piston to move to its open position in which hot refrigerant is directed to the evaporator.

3,715,895

DRINKING CUP FOR FREEZING A BEVERAGE TO A SLUSH-LIKE CONDITION

Edward J. Devlin, Madison, Conn., assignor to Glacier Ware, Inc., Clinton, Conn.

Filed July 8, 1970, Ser. No. 53,231
Int. Cl. F25d 3/00
U.S. Cl. 62—457 11 Claims



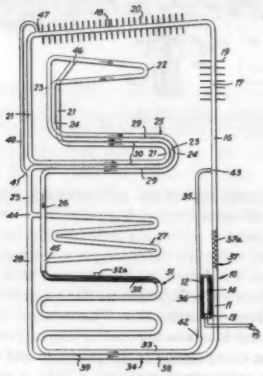
A portable liquid cooling container having a receptacle of a predetermined capacity and a surrounding receptacle defining a compartment for a refrigerant having a sufficient heat absorption capability to convert the liquid contents of the receptacle from a liquid to a semi-congealed condition under ordinary room temperature conditions.

3,715,896

ABSORPTION REFRIGERATION APPARATUS OF THE INERT GAS TYPE

Nicolas Eber, Zurich, Switzerland, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed May 7, 1971, Ser. No. 141,294
Int. Cl. F25b 15/10
U.S. Cl. 62—490 7 Claims



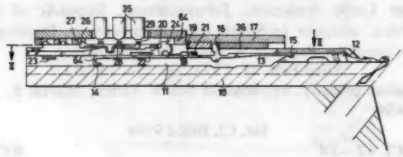
In absorption refrigeration apparatus of the inert gas type all of the parts are formed of piping and are of the same diameter except the pump pipe and vent pipe connecting the outlet end of the condenser to the inert gas circuit. These particular pipes also can be formed of the same size piping employed to form all of the other parts of the apparatus by deforming them so that they are non-circular in cross-section and will carry out their intended function during operation of the apparatus.

3,715,897

FLAT BED KNITTING MACHINE

Wilhelm Hadam, Reutlingen, Germany, assignor to H. Stoll and Company, Stollweg, Germany

Filed March 4, 1971, Ser. No. 120,836
Claims priority, application Germany, March 9, 1970, P 20 10 973.3
Int. Cl. D04b 7/00, 15/66
U.S. Cl. 66—75 R 14 Claims



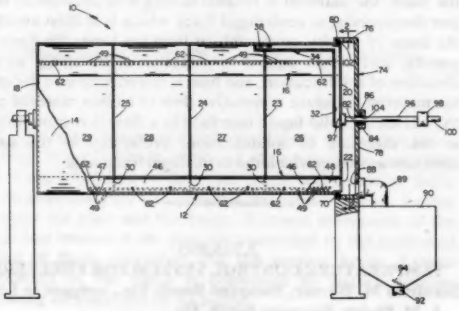
A flat bed knitting machine of the type in which needles are movable in tricks under the action of selector jacks, wherein the selector jacks have butts which operatively engage knitting, transfer and re-setting locks and wherein movement of the selector jacks is controlled by a patterning lock. The patterning butt of the selector jack is adjustable relative to the body of the selector jack. This adjustable patterning butt is in the form of a bridge element pivotably connected to the selector jack and movable between two end positions by a spring and an electrically operated device. Elements fixed to the patterning lock advance and return the selector jacks.

3,715,898

WASHING MACHINE

James R. Olliges, Sr., River Grove, Ill., assignor to A-TO, Inc., Willoughby, Ohio

Filed April 13, 1971, Ser. No. 133,546
Int. Cl. D06f 37/06, 37/08
U.S. Cl. 68—145 13 Claims



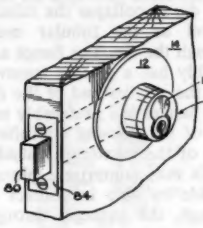
A washing machine of the type including a cylindrical drum rotatable in at least one direction about a horizontal axis and including at least one hollow in transverse-cross section rib projecting radially inwardly from the cylindrical wall of the drum and extending longitudinally of the drum, the rib defining in cooperation with a portion of the drum wall a longitudinally-extending passage and the portions of the rib defining the passage, other than a longitudinally-extending rib portion adjacent the drum wall, being imperforate.

3,715,899

RIM CYLINDER LOCK MECHANISM

Rolland Gene McCullum, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Aug. 9, 1971, Ser. No. 169,989
Int. Cl. E05b 27/00
U.S. Cl. 70—369 15 Claims



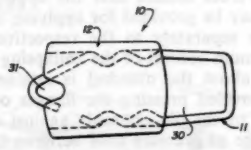
A lock cylinder for mounting on the face of a door with mounting screws which are concealed by a face plate which is breech locked to the cylinder body and held in locked position by reception of a lock core in non-concentric aligned openings in the face plate and body. The core and non-concentric openings are desirably figure-8 shaped, and the mounting screws located beside the narrow waist portion of the figure-8 shape, within a cylindrical envelope. A bolt is actuated by a bell crank which swings in an arc between the two screws.

3,715,900

KEY RETAINER

Alan E. Sherman, Maryland Heights, Mo., assignor to Aranar Marketing Services, Inc., Chicago, Ill.

Filed Nov. 9, 1970, Ser. No. 87,789
Int. Cl. A47g 29/10
U.S. Cl. 70—456 R 4 Claims



A key retainer comprising generally a loop of resilient material having only one discontinuity provided by substantially facing adjacent ends thereof. This loop normally is slidably disposed within a sleeve, in a fashion such that one end thereof forms a relatively large ring for holding several keys whose ready removal normally is not required, and the opposite end thereof forms a smaller ring for holding a key or keys whose ready removal is desired.

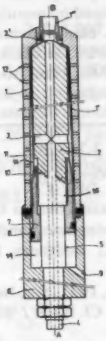
3,715,901

APPARATUS FOR TAPERING FLEXIBLE TUBES

Roger Couland, 51, rue Maurice Philippot, 92 Fontenay-aux-Roses, France

Filed March 2, 1970, Ser. No. 15,735
Claims priority, application France, March 18, 1969, 6907626
Int. Cl. B21d 26/04
U.S. Cl. 72—58 11 Claims

Apparatus for tapering cylindrical tubes formed of a flexible material comprising a supporting member having a generally cylindrical cross section adapted to be inserted into a cylindrical flexible tube to thereby support the tube and having passage means defined in the support member to transmit a fluid pressure to the periphery of the support member, a matrix having a substantially conical cross section into which the support member, upon which is mounted a tube, is inserted and a moveable sleeve member adapted to be engaged



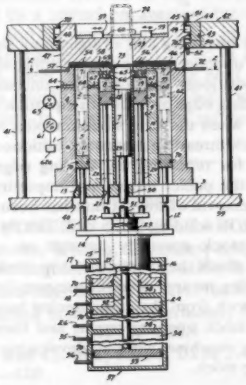
in a sealing relationship with the base of the flexible tube which is moveable in response to fluid pressure to continuously maintain the sleeve member in a sealing engagement with the base of the tube while a fluid pressure is supplied to the passage means in the support member to expand the wall of the flexible tube so that it corresponds to the configuration of the matrix.

3,715,902

METHOD AND APPARATUS FOR OPERATING ON A BLANK OF MATERIAL, E.G., DEEP DRAWING

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co. Inc., New York, N.Y.

Filed Feb. 10, 1971, Ser. No. 114,198
Int. Cl. B21d 22/20
U.S. Cl. 72—60 192 Claims



Pressurized viscous fluid, pumped by annular pistons, flows in contact with one surface of a blank inwardly from the periphery thereof, thereby to force the opposite surface of the blank against a low friction surface, thereby to pressurize the blank and exert viscous drag force on the surface of the blank to extrude the peripheral portion of the blank inwardly, in cooperation with a ram perpendicularly engaging the central portion of the blank, to deep draw the blank through a die

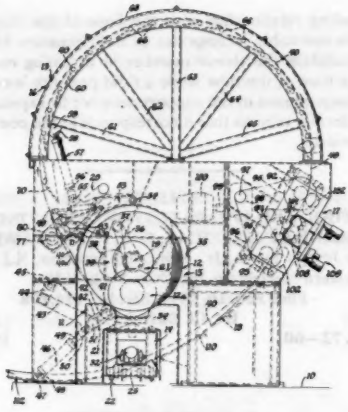
opening. In a modification, a heating element is provided in contact with the flow of viscous fluid opposite the surface of the blank contacted by the viscous fluid to raise the efficiency of the operation. In another modification, by proper staging, the average pressure in the viscous fluid can be made to increase in the overall direction of flow of the viscous fluid. The viscous fluid can be applied to inwardly extrude the blank uniformly or non-uniformly. In yet another modification, pressurized viscous fluid, pumped by annular pistons, flows in contact with both faces of a blank inwardly from the periphery thereof, thereby to pressurize the blank and exert viscous drag force on both surfaces of the blank to extrude the peripheral portion of the blank inwardly.

3,715,903

STRIP STOCK UNCOILER AND STRAIGHTENING DEVICE

John A. Huber, Birmingham; Berlyn E. Baringer, Southfield; Eilert F. Bruns, Birmingham, and Michael R. Ulewicz, Warren, all of Mich., assignors to P.A.S.-Artco, Inc., Detroit, Mich.

Filed Jan. 13, 1971, Ser. No. 106,126
Int. Cl. B21d *1/02*
U.S. Cl. 72—183 **16 Claims**



A machine for uncoiling and straightening strip stock having a strip stock uncoiler means and an adjustable strip stock peeler means positioned adjacent the uncoiler means for stripping the leading edge of a coil of strip stock away from the body of the coil when the strip stock uncoiler means is actuated. A strip stock threading means is positioned adjacent the uncoiler means for receiving the leading edge of the strip stock coil from the peeler means and imparting to the strip stock a partial removal of the set that has been placed in the strip stock due to its winding into a coil. The threading means feeds the strip stock upwardly through an upper arcuate threading chute which then feeds the strip stock downwardly into a straightening means. A lower arcuate threading chute feeds the strip stock from the straightening means down and under the strip stock uncoiler means and thence to a strip stock processing machine without developing a set in the straightened strip stock.

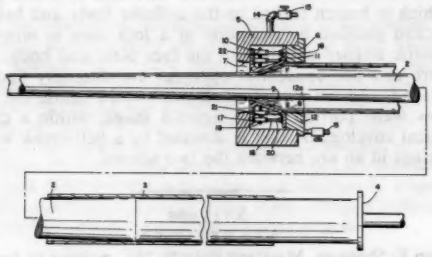
3,715,904

DIE ASSEMBLY

Frank J. Lesko, Phoenix, Ariz., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 14, 1971, Ser. No. 106,344
Int. Cl. B21c *3/06*
U.S. Cl. 72—276 **13 Claims**

A die assembly for forming a tubular metal blank on a tapered mandrel into a tapered tube conforming to the taper of the mandrel comprising a die composed of non-metallic plastic material capable of being repeatedly stretched outwardly and contracted back to its original form, the die having a passage therethrough tapering from minimum cross section near one end of the die to maximum cross section near the opposite end of the die and desirably having outwardly projecting flanges at its respective ends, a housing in which the die is mounted and means for applying fluid pressure in the housing against the outside of the die to collapse the tubular metal blank about the mandrel as the tubular metal blank and mandrel pass through the die. The flange at the larger end of the die preferably has a greater transverse dimension than the flange at the smaller end of the die. The outside dimensions of the flanges are preferably smaller than the inside dimensions of the housing opposite the flanges by at least about 6% of the maximum outside dimension of the flanges. The die may comprise a plurality of die elements arranged side by side in contact each having a passage therethrough, the passages through the die elements being coaxial but of different cross-sectional dimensions to provide in effect a passage through the die tapering from minimum cross section near one end of the die to maximum cross section near the opposite end of the die. Means may be provided for applying and controlling fluid pressure separately to the respective die elements whereby optimum control of the collapsing of the tubular metal blank about the mandrel is attained. Means are preferably provided pressing the flanges of the die generally axially of the die assembly against the housing to prevent leakage of pressure fluid between the flanges and the housing. Spaced apart struts are preferably provided which extend generally axially of the die assembly between the flanges to press the flanges against the housing. The struts are desirably longitudinally extensible to enable them to exert a controlled degree of pressure against the flanges; they may be provided with threaded extension devices. Desirably hollow pressure transmitting members lie against the flanges and the struts apply pressure against such members.



3,715,905

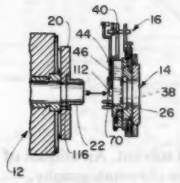
PART FEED FOR APPARATUS SUCH AS METALLIC CAN BODY FORMERS

Elpidifor Paramonoff, Los Angeles, Calif., assignor to Standun Inc., Compton, Calif.

Filed April 1, 1971, Ser. No. 130,195
Int. Cl. B21d *24/16*
U.S. Cl. 72—349 **3 Claims**

Cup-shaped metallic can bodies are fed downwardly, one at a time, into a part holder between a withdrawn horizontally reciprocal ram and a redraw and ironing die pack of a can body former, a redraw die pad first advancing a redraw die

horizontally into the can body open end, followed by the ram moving into the can body within the redraw die and carrying the can body progressively through a redraw die ring and a series of ironing die rings. The part holder has a U-shaped yoke receiving the can bodies downwardly therein and positioning the can bodies in exact longitudinal alignment with the redraw die and ram movements by individually selectively adjustable, transversely spaced side and underlying bottom alignment members. Each of the alignment members has a main portion



movable in a yoke vertical slot and a pin projecting from the main portion and yoke toward the redraw die pad, the alignment member main portion and pin having longitudinally aligned surfaces exposed inwardly of the part holder yoke forming spaced holding surfaces extending a major portion of the cup longitudinal length to exactly position the cup. The part holder alignment members each have adjustment means for moving the alignment member main portions within the yoke slots to obtain the exact cup positioning.

3,715,906

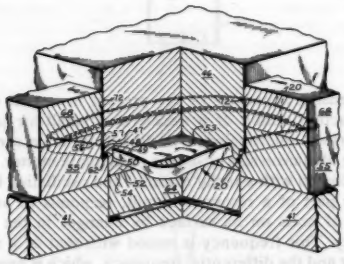
METHOD AND APPARATUS FOR FORMING A SHADOW MASK FRAME

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Mar. 30, 1971, Ser. No. 129,483

Int. Cl. B21d *19/08*

U.S. Cl. 72—354 **11 Claims**



A method and apparatus for forming a shadow mask frame having a dish-shaped wall positioned obliquely with respect to the longitudinal axis of the frame. The shadow mask frame is formed by applying columnar force to a wall of a workpiece in a direction parallel to the longitudinal axis causing complete plastic deformation of the frame. Simultaneous to the step of applying force, a second wall of the workpiece is contained within a pair of concave convex complementary sized dies so as to form a dish-shaped configuration. The apparatus has a top die with stuffing ledge movable toward a bottom die with a convex portion. The stuffing ledge forces the workpiece between the complementary sized dies thereby forming the dish shape. Simultaneously, a punch passes through the workpiece and is held therein during the plastic deformation to accurately size the opening of the shadow mask frame.

3,715,907

APPARATUS FOR SUPPORTING SHEET MATERIALS IN BENDING PRESSES

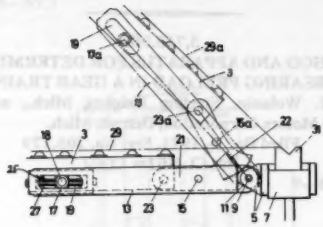
Teruma Hamada, Tokyo, Japan, assignor to Amada Co., Limited, Kanagawa-prefecture, Japan

Filed Oct. 26, 1970, Ser. No. 83,966

Claims priority, application Japan, Oct. 29, 1969, 44/86,049

Int. Cl. B21d *43/00;* **B23g** *3/18*

U.S. Cl. 72—419 **7 Claims**



For use with press-brakes or sheet-metal bending presses, an apparatus comprising at least one mechanism including a member for supporting sheet materials to be bent, which member is rotatably and slidably supported by a first link member pivotally mounted on a table of the press-brake, and further pivotally supported by a second link member which is also rotatably supported by the first link member, the rotational movement of the second link member relative to the first link member being regulated by a geared engagement between the second link member and the press-brake table in such a way that the supporting member is at all times in contiguous contact with the sheet materials being bent. The described mechanism is usually provided on both sides of the supporting member in a substantially symmetrical arrangement.

3,715,908

FORGING MANIPULATORS

Ludwig Schussler, Willich, Germany, assignor to Schloeman Aktiengesellschaft, Dusseldorf, Germany

Filed May 21, 1970, Ser. No. 39,219

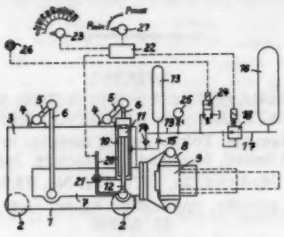
Claims priority, application Germany, May 24, 1969, P 19 26 638.7

Int. Cl. B21j *13/10;* **B23q** *3/00*

U.S. Cl. 72—420 **3 Claims**

In a forging manipulator, apparatus is provided for controlling the position of workpiece holding jaws with respect to the body of the forging manipulator. The jaws are mounted on the body by a suspension system including a pressure fluid operated cylinder and piston unit, a first accummulator in fluid connection with the cylinder, a second accummulator for higher pressure fluid connected through a pressure regulating valve to the first accummulator, and sensing means, such as a potentiometer, for providing a control signal in accordance with

the relative positions of the cylinder and piston to control the pressure regulating valve to admit fluid as necessary



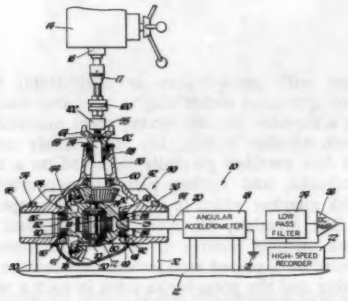
into the first accummulator so as to bias the suspension system to a predetermined position.

3,715,909

METHOD AND APPARATUS FOR DETERMINING BEARING PRELOAD IN A GEAR TRAIN

Michael J. Wolanin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1971, Ser. No. 205,179
Int. Cl. G01m *13/02*
U.S. Cl. 73—9 **7 Claims**



An angular accelerometer is connected to a gear train so as to measure the deceleration of one of two meshed gears having backlash as the gears move independently of each other during the period after rotational power input to the gear train is disconnected when the backlash is taken up. The only resisting torque exerted on the one gear during the backlash takeup period is the drag torque of the preloaded bearings rotatably supporting it which varies directly with the bearing preload. The drag torque is determined from the measured deceleration and from this drag torque the bearing preload is determined.

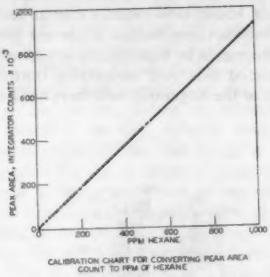
3,715,910

DETERMINATION OF RESIDUAL SOLVENT IN OILSEED MEALS AND FLOURS BY A VOLATILIZATION PROCEDURE

Sara P. Fore; Eric T. Rayner, and Harold P. Dupuy, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Jan. 26, 1971, Ser. No. 109,883
Int. Cl. G01n *31/08, 25/14*
U.S. Cl. 73—23.1 **3 Claims**

This invention relates to a simple volatilization procedure for the determination of residual solvents in oilseed meals and flours. A sample of meal or flour and water are weighed into a serum bottle. The bottle is sealed and heated in an oven to volatilize the residual solvent. An aliquot of the headspace gas is then analyzed by gas chromatography.

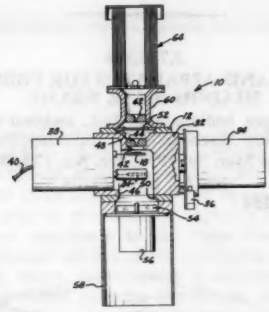


3,715,911

APPARATUS FOR SENSING AIR-BORNE PARTICULATE MATTER

Raymond L. Chuan, Altadena, Calif., assignor to The Susquehanna Corporation

Filed May 11, 1970, Ser. No. 36,222
Int. Cl. G01n *15/02*; G08b *21/00*
U.S. Cl. 73—28 **12 Claims**



The sensing apparatus of the present invention combines the impaction action of a decelerated small air jet with a quartz crystal microbalance to detect, by mass sensing, the presence of micron size air-borne particulate matter. A quartz crystal, coated with a tacky material and oscillating in a shear mode as part of a resonant circuit, responds to very small changes of mass on its surface by changes in the resonant frequency. This frequency is mixed with that of a reference oscillator and the differential frequency, which is proportional to collected mass, may be counted or converted to an analog signal suitable for direct recording or display, or for the performing of control functions.

3,715,912

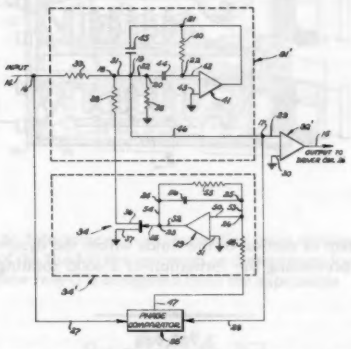
DENSITOMETER

Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed April 8, 1971, Ser. No. 132,493
Int. Cl. G01n *9/00*
U.S. Cl. 73—32 **13 Claims**

A vibration densitometer having a resonant structure and a tracking filter with a limited tracking band, and an oscillator

to add an alternating signal to the filter input of an amplitude less than that supplied thereto at the resonant frequency of the structure when the structure is vibrating. The oscillator output signal has a frequency which is located midway between the upper and lower limits of the tracking band. Without the oscillator the densitometer will not resonate under moderate conditions of pipeline noise. The oscillator provides reliable self-starting. It gives both an amplitude and a frequency boost. The densitometer switches immediately to the resonant frequency after first homing in on the oscillator output signal.



3,715,913

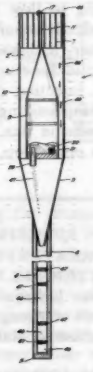
AQUATIC SEDIMENT AND POLLUTION MONITOR

Roger Y. Anderson, 5014 Guadalupe Tr., N.W., Albuquerque, N. Mex.

Filed March 25, 1971, Ser. No. 127,891

Int. Cl. G01n *1/20*

U.S. Cl. 73—61 R **15 Claims**



An aquatic sediment and pollution monitor adapted to be positioned in a body of water comprising an elongated, vertically alignable, collecting tube having an open upper end and a closed lower end for collecting, over a long period of time, the natural materials and polluting substances that accumulate in the body of water. A generally funnel-shaped magnifying cone is positioned with the small diameter end thereof extending into the open end of the collecting tube to magnify the amount of sediment and pollution collected. A baffle is positioned in the magnifying cone adjacent the large diameter end thereof for minimizing turbulence in the collecting tube and for preventing entrance thereinto of large organisms. Means are also provided for automatically marking, at regular intervals, the quantity of sediment and pollution accumulated in the collecting tube during such intervals.

3,715,914

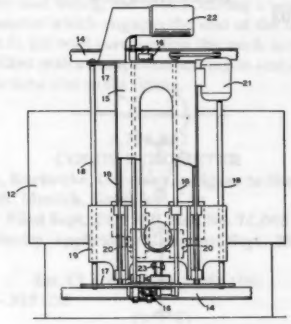
ON SITE PRESSURE VESSEL INSPECTION DEVICE

Leonard B. Gross; Charles R. Johnson, both of Lynchburg, and Stephen C. Nattsas, Bedford, all of Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,831

Int. Cl. G01n *9/24*

U.S. Cl. 73—67.7 **10 Claims**



A remotely controlled method for the non-destructive inspection of the primary pressure containment means of a nuclear reactor, on the site of use, for the detection of degradation resulting from sustained exposure to radiation. This method utilizes dual probes operating on a send-and-receive basis, wherein an ultrasonic beam is sent into a thick vessel wall describing a V-like path in the same. The transducers are fixed with respect to each other, and are transported about a programmed course in fixed relation to the vessel, so as to allow the beam to inspect 100 percent of the steel in such wall. If a defect was present in the steel, it would interfere with the path of the ultrasonic beam and a corresponding loss of energy would be detected and recorded. A comparison of the record of signals resulting from this inspection, with an established pattern of signals having its inception prior to service would indicate the initiation and propagation of a defect so that, if necessary, remedial procedures could be undertaken.

3,715,915

LIGHT INTENSITY STRAIN ANALYSIS

Jerry G. Williams, Hampton, Va., assignor to The United States of America as represented by the Administrator of National Aeronautics and Space Administration

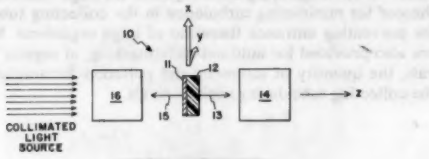
Filed April 28, 1971, Ser. No. 138,230

Int. Cl. G01b *11/18*

U.S. Cl. 73—88 A **13 Claims**

A process for the analysis of the strain field of structures subjected to large deformations involving a low modulus sub-

strate having a high modulus, relatively thin coating thereon. The optical properties of transmittance and reflectance are



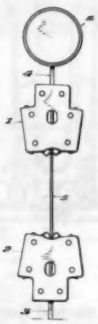
measured for the coated substrate while stressed and unstressed to thereby indicate the strain field for the coated substrate.

3,715,916

GRIPS FOR HOLDING SPECIMENS

Fernald S. Stickney, West Caldwell, N.J., assignor to Instrument Specialties Company, Inc., West Paterson, N.J.

Filed Jan. 26, 1971, Ser. No. 109,860
Int. Cl. G01n *3/04*
U.S. Cl. 73—103 **10 Claims**



Grips for tensile testing of a specimen, such as a strip of metal, arranged in pairs in longitudinal aligned relation to grip opposite end portions of a specimen strip, the tensile strength of which is to be determined in a suitable testing machine such, for example, as one attached to a dynamometer. Each of the grips comprises a frame including a pair of side plates in clamping relation with compression blocks therebetween, forming an elongated throat. A pair of gripping members, such as wedges, are slidably mounted in the throat and have bearing relation against the compression blocks. The inner opposed faces of the wedges are adapted to receive an end of the specimen therebetween. The throat is open at opposite ends for access to the wedges to move these bodily with respect to the compression blocks or relative to the bearing means thereof to cause frictional engagement between the wedges and the specimen or to release the wedges therefrom.

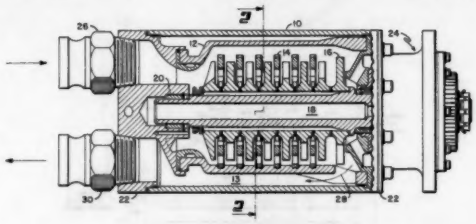
3,715,917

NON-ROUND FLUID DYNAMOMETER

Joachim C. Bronder, Trumbull, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Sept. 17, 1971, Ser. No. 181,358
Int. Cl. G01l *3/20*
U.S. Cl. 73—134 **5 Claims**

The operating characteristics of an otherwise conventional fluid dynamometer are improved by supporting the rotor and stator disks within a housing having a cross section which is non-round. The use of the non-round housing causes a change



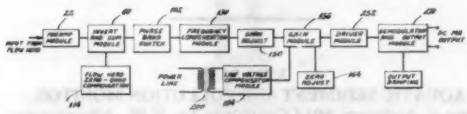
in direction of motion of the fluids within the dynamometer, thereby preventing the formation of a solid rotating core of fluid.

3,715,918

MAGNETIC FLOWMETER APPARATUS

John E. Bailey, Needham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed April 29, 1970, Ser. No. 32,804
Int. Cl. G01f *1/00*; **G01p** *5/08*
U.S. Cl. 73—194 EM **30 Claims**



Magnetic flowmeter apparatus comprising a flow head producing an alternating flow potential which is directed to an electronic transmitter apparatus arranged to produce a d-c flow signal corresponding to flow rate. The transmitter includes a number of physically separate modules each including a solid-state amplifier, and having circuit elements arranged to provide specific functions such as zeroizing the common mode signals, injecting quadrature and in phase signal components, compensating for line voltage and frequency variations, and the like. The overall transmitter system is arranged in an open-loop, non-feedback configuration.

3,715,919

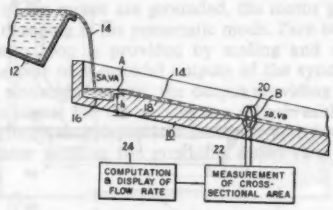
METHOD AND APPARATUS FOR MEASURING THE FLOW RATE OF ELECTRICALLY CONDUCTIVE FLUIDS

Hiroshi Kishimoto; Kenzo Kobayashi; Yoshiharu Hamazaki, and Mituaki Danno, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed April 6, 1970, Ser. No. 25,668
Claims priority, application Japan, April 7, 1969, 44/26734; April 7, 1969, 44/26735
Int. Cl. G01f *13/00*
U.S. Cl. 73—194 E **16 Claims**

A process and apparatus for measuring the flow rate of electrically conductive fluids comprises flowing an electrically conductive fluid down an inclined passageway and through electromagnetic coils disposed respectively around upstream

and downstream portions of the passageway. A change in inductance of each coil due to the electrically conductive fluid is



measured to determine the corresponding cross sectional area SA or SB of the fluid at the upstream or downstream locations. Then the flow rate Q is computed from the expression

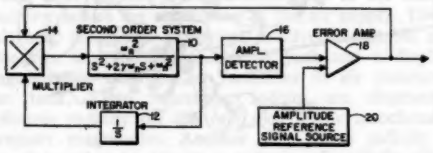
$$Q=\frac{SA\cdot SB}{\sqrt{SA^2-SB^2}}\sqrt{2gh}$$

where g is the acceleration due to gravity and h is a vertical difference in level between both coils. When the downstream portion has a much higher in flow speed than the upstream portion, $Q=SB\sqrt{2gh}$ is used.

3,715,920
APPARATUS FOR DETERMINING THE DAMPING RATIO OF A SECOND ORDER VIBRATION SYSTEM

Leslie J. Groberman, Minneapolis, and Edward R. Wuori, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed April 20, 1971, Ser. No. 135,785
Int. Cl. G01f 1/00
U.S. Cl. 73—194 B **7 Claims**

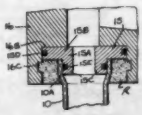


Apparatus for measuring the damping ratio of a second order system. The apparatus takes the form of a mass rate flow meter comprising an impact plate adapted to be inserted in a fluid flow. The plate and its mounting means forms a second order system which has a damping ratio proportional to the rate of mass flow. The plate is connected in a loop with an integrator, or a differentiator, and a multiplier. The integrator of differentiator provides, among other things, phase shifting. The loop gain is increased until the loop oscillates. Automatic gain control stabilizes the oscillations and the amplitude of the loop oscillations is compared with a reference quantity. The signal resulting from this comparison is used to adjust the gain of the multiplier such that the amplitude of the loop oscillations is kept constant. The signal used to adjust the gain of the multiplier is proportional to the damping ratio of the second order system and therefore is also proportional to the mass flow rate.

3,715,921
END-SEALED VARIABLE-AREA FLOWMETER

Oscar H. Grauer, Jenkintown; Omund A. Seglem, Doylestown, and Erwin K. Kaucher, Souderton, all of Pa., assignors to Fisher & Porter Company, Warminister, Pa.

Filed Oct. 6, 1971, Ser. No. 187,014
Int. Cl. G01f 1/00
U.S. Cl. 73—209 **14 Claims**

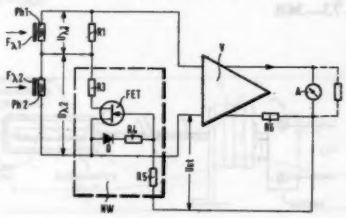


A flowmeter of the rotometer type, wherein a variable-area meter tube is supported at its ends between inlet and outlet fittings. Each end fitting is permanently secured to the meter tube. This is accomplished by means of a hollow socket of corrosion-resistant material which is received within a well formed in the end fitting, the socket having a neck section of reduced diameter which engages the end of the tube. The annular region in the well surrounding the neck section and the tube end is filled with a compound serving to seal-in the socket and bond the tube end to the fitting.

3,715,922
COLOR PYROMETER

Kurt Menge, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 21, 1970, Ser. No. 74,098
Claims priority, application Germany, Sept. 20, 1969, P 19 47 791.9
Int. Cl. G01j 5/60; G05f 1/60
U.S. Cl. 73—355 EM **3 Claims**



A color pyrometer with two photo devices responding to different wavelengths and having output resistors connected in opposition. One resistor is controlled by a feedback voltage obtained from a differential amplifier responding to the voltage differential across the resistors to maintain the differential at 0. The controlled resistance or the feedback voltage is a measure of the ratio of received radiation intensities at the two wavelengths.

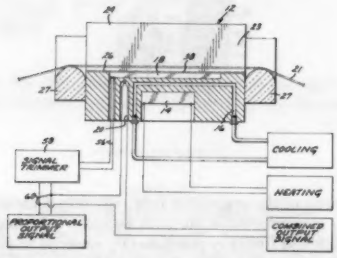
3,715,923
TEMPERATURE MEASURING METHOD AND APPARATUS

David R. Hornbaker, 1520 Cole Way, La Habra, and Dieter L. Rall, 11818 E. North Circle Dr., Whittier, both of Calif.

Filed July 23, 1970, Ser. No. 57,629
Int. Cl. G01k 1/16, 7/12
U.S. Cl. 73—361 **14 Claims**

A temperature measuring method and apparatus, the apparatus including a thermal sink or reference body signal a

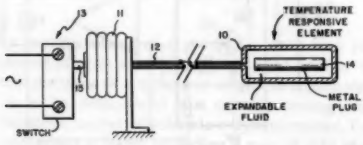
heat flow sensor, and operative to determine the temperature of an external medium or body by utilizing the principle that convective and conductive heat exchange between the reference body and the external body will be zero when the bodies are at the same temperature, the apparatus in one embodiment having the heat flow sensor mounted in a reference body whose temperature is known. The method of the invention yields the absolute temperature of the external body by using the heat flow sensor to sense the rate of convective heat flow between the bodies, and then calibrating the resulting signal or output in terms of the temperature difference between the bodies. In one embodiment of the apparatus the external body is carried through or across the reference body a predetermined distance from the heat sensor to facilitate calibration of the heat flow sensor output signal.



3,715,924
FLUID EXPANDABLE TEMPERATURE APPARATUS HAVING EXCESSIVE TEMPERATURE RELIEF APPARATUS

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 4, 1970, Ser. No. 69,864
Int. Cl. G01k 5/02; H01h 37/36
U.S. Cl. 73—368 6 Claims



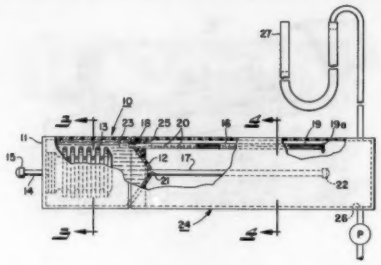
A temperature responsive control apparatus having a fluid filled system wherein upon a change in temperature of a fluid filled responsive element an increase in volume of the fluid produces an output. A metal plug which is contained in the fluid of the responsive element has a substantially constant volume throughout the normal temperature working range, but decreases in volume above a predetermined maximum temperature to limit the volume change to protect the control apparatus when being exposed to excessive destructive temperatures above the predetermined temperature.

3,715,925
MINIATURE RECORDING ALTIMETER

Ernest W. Miller, 20946 Northwood, Fairview Park, Ohio

Filed Oct. 26, 1971, Ser. No. 192,168
Int. Cl. G01l 7/18
U.S. Cl. 73—384 12 Claims

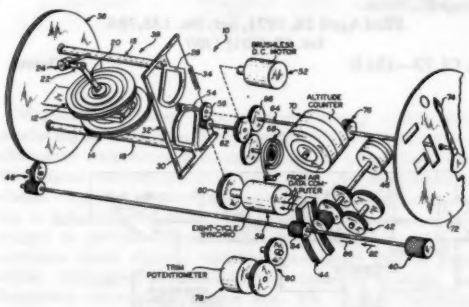
A recording altimeter is provided and particularly a miniaturized, compact altimeter adapted for use in flying amusement devices. The altimeter includes a pressure-sensitive system having gauge means, the entire system and gauge means normally being filled with an incompressible fluid such as an alcohol-water mixture. As the pressure outside of the altimeter decreases, part of the incompressible fluid is expelled from the gauge means. After the altimeter returns to original pressure conditions, the partial loss of water from the gauge means reflects a minimum pressure or pressure difference to which the altimeter has been subjected.



3,715,926
DUAL MODE ALTIMETER

Geoffrey S. Hedrick, Malvern, Pa., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed June 28, 1971, Ser. No. 157,582
Int. Cl. G01l 7/14
U.S. Cl. 73—387 20 Claims



In a dual mode altimeter having an altitude display means, pressure responsive drive means, including diaphragm capsules adapted to expand and contract in response to changes in altitude, mechanical means connecting the pressure responsive drive means to the display means for driving the display means in response to expansion and contraction of the capsules, a remote altitude signal source and a servo means including a follow-up synchro connected in driving relationship to the altitude display, the servo being responsive to a signal received from the remote source for effecting overriding of the pressure responsive drive means for driving the mechanical means and, thus, the display means in response to the received signal, the improvement comprises a brushless D.C. motor operatively connected to the synchro in a closed servo loop and to the mechanical means. The motor is directly connected to a central pinion which is

in meshing relationship with a gear sector operatively connected through a rocking shaft to the diaphragm capsules. In the servoed mode of the altimeter, the brushless D.C. motor drives the altitude display. In the pneumatic mode, the servo loop is electrically opened and the excitation windings of the motor are grounded, the motor providing magnetic damping in the pneumatic mode. Zero correction of the servo loop is provided by scaling and summing one of the pair of sinusoidal outputs of the synchro with the other sinusoidal output, the output providing an error correction signal for the servo loop. The brushless D.C. motor includes an independent feedback path including a second stator winding for providing direct rate feedback control.

3,715,927

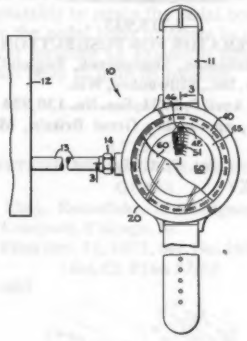
GAUGE FOR INDICATING EXHAUST TIME OF AIR SUPPLY FOR SCUBA DIVERS

Roger L. Grant, 1243 Monte Vista St., San Luis Obispo, Calif. 93401

Filed Mar. 5, 1971, Ser. No. 121,255

Int. Cl. G01l *19/00, 7/04*

U.S. Cl. 73—389 **8 Claims**



A wrist-type gauge for a scuba diver to enable the scuba diver to take a direct reading as to the time remaining before the exhaustion of the air supply. Toward this end, the gauge comprises relatively rotatable discs. One disc is connected to the air tank and is displaced angularly in response to variations in air pressure in the tank. Time remaining indicia are disposed in columns radially on the one disc under associated air pressure magnitudes. Another disc has a radially disposed opening to expose a column of radially aligned time remaining indicia on the one disc. On the other disc is disposed radially aligned depth indices adjacent an opening. An operator is informed of the depth of his location and reads through the opening the exposed time remaining for the exhaustion of air in the tank by aligning through radial distance the time remaining value with the selected depth of location.

3,715,928

VARIABLE SPEED POWER TRANSMISSION

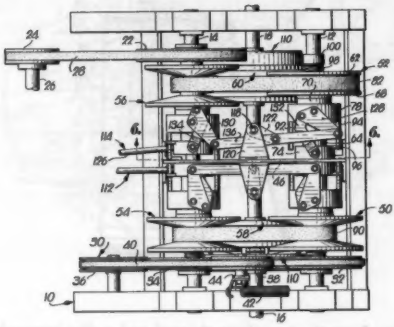
Cecil L. Case, and Harold Keith Garrison, both of Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 7, 1971, Ser. No. 187,323

Int. Cl. F16h *9/00, 11/00*

U.S. Cl. 74—218 **21 Claims**

A belt transmission having forward and reverse shafts, power driven continuously in opposite directions, utilizes operator-controlled, dual section sheaves for driving one or a pair of output shafts at infinitely variable speeds in either of two directions. Both sections of the operator-actuated sheaves are shiftable axially of their shafts, permitting use of symmetrical belting. Either or both of the output shafts may be driven



forwardly or in reverse at selected speeds without interrupting the power to either of the two counter-rotating shafts. When the sections of the continuously rotating sheaves are open, their belts rest upon idler bearings between the sections.

3,715,929

CAM BARREL FOR HOLDING AT LEAST ONE DISPLACEABLE LENS ELEMENT

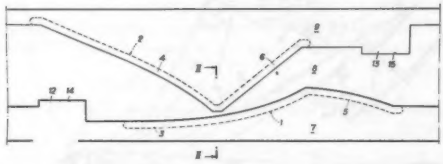
Franz Konigslehne, Ste. Croix, Switzerland, and Hanns Plihal, Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Oct. 26, 1970, Ser. No. 83,990

Claims priority, application Austria, Oct. 31, 1969, A 10289/69

Int. Cl. F16h *53/00*

U.S. Cl. 74—567 **6 Claims**



A cylindrical barrel body comprises at least two axially aligned annular members, one of which is formed with a cam face which is inclined to the generatrices of said barrel body. Said two annular members have mutually confronting end faces extending along said cam face.

3,715,930

VARIABLE DIAMETER CENTRIFUGALLY-OPERATED DRIVE PULLEY

Gilles Beliveau, 1225 Fremont St.; Jean-Marc Beliveau, 426 St. Joseph Blvd. West, and Victor Beliveau, 8352 Place Mont Richard, Ville d'Anjou 434, all of St. Bruno de Montarville, Quebec, Canada

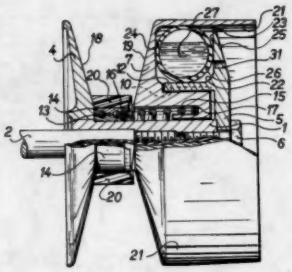
Filed May 27, 1971, Ser. No. 147,337

Int. Cl. F16h *11/06*

U.S. Cl. 74—230.17 E **1 Claim**

A variable diameter pulley for use as a drive pulley in a V-belt drive assembly in which the axially movable pulley half is

moved towards the fixed pulley half under action of centrifugal forces, said centrifugal forces being produced by a liquid filled annular flexible liquid-tight tube disposed in a chamber defined by the axially movable pulley half, a cylindrical wall depending from the periphery thereof and a disc secured to the drive shaft. Rotation of the liquid causes flattening of the tube with increase of rotational speed, thereby displacing the movable pulley half towards the fixed pulley half.



3,715,931

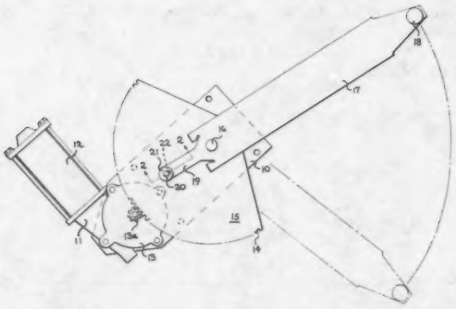
GEAR MOUNTED DRIVE ARM ADAPTED TO FLEX AS CANTILEVER BEAM

Joseph C. Littmann, Temperance, Mich., assignor to Dura Corporation, Toledo, Ohio

Filed April 19, 1971, Ser. No. 135,047

Int. Cl. F16h *57/00*; **E05f** *11/24*

U.S. Cl. 74—411 **6 Claims**



A vehicle window regulator drive arm, or the like is, mounted on the pivot pin of a power driven gear sector. An integral extension is on the inner end of the drive arm, the end of which has a pin and slot connection with the gear sector. The arm extension is shaped to provide flexure without stress risers and flex like a cantilever beam about the pivot pin. The pin and slot connection affords the movement necessary as the drive arm foreshortens while flexing.

3,715,932

SPEED REDUCER

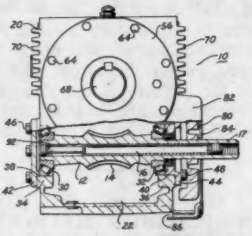
Theo F. Sharp, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Nov. 9, 1970, Ser. No. 87,703

Int. Cl. F16h *1/16*; **F24h** *3/00*; **F28d** *15/00*

U.S. Cl. 74—425 **15 Claims**

A mechanical power transmission means in which there is a driving element, a driven element, and a shaft on which one of the elements is mounted. The shaft contains a chamber with a heat pipe system therein for transmitting heat generated in or transferred to the element on said shaft, to a point remote from the element for regulating the temperature in the power transmission means. The present concept is particularly adapted to speed reducers of the worm and gear type.



3,715,933

JOYSTICK OPERATOR FOR PUSHBUTTON SWITCH

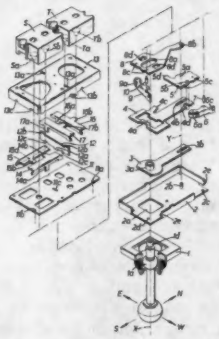
Douglas Burton Robinson, Sharnbrook, England, assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed April 5, 1971, Ser. No. 130,954

Claims priority, application Great Britain, May 4, 1970, 21,239/70

Int. Cl. G05g *9/04*

U.S. Cl. 74—471 XY **8 Claims**



A mechanism for actuating selected ones of a plurality of plungers comprising a plurality of levers each of which is rotatable in engagement with at least one corresponding plunger to actuate the plunger and a common operating member to selectively rotate said levers.

3,715,934

ACCELERATOR PEDAL

Lawrence N. Reed, Warren, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

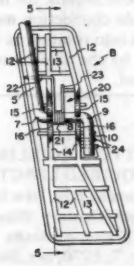
Filed Dec. 3, 1971, Ser. No. 204,588

Int. Cl. G05g *1/14*

U.S. Cl. 74—560 **15 Claims**

An accelerator pedal adapted for mounting on a throttle linkage including an elongated lever having a laterally ex-

tending arm adjacent one end thereof comprises a pedal body having spaced apart pairs of mounting projections extending from one side thereof and between which the arm of the throttle lever is rotatably accommodated. The projections include flexible retaining fingers which extend



toward the pedal body along converging lines. Each retaining finger has a free end which bears against the lever arm so as rotatably to retain the pedal body on the arm. A spring biases the pedal body to rotate in one direction and the lever arm includes an extension which is engageable with the pedal body to limit its rotation.

3,715,935

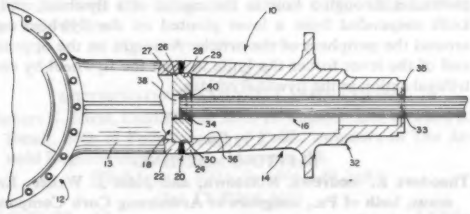
WELD FIXTURE AND AXLE SHAFT INSTALLATION GUIDE

Edward W. Ebey, Roundlake, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,043

Int. Cl. F16h *57/02*

U.S. Cl. 74—607 **5 Claims**



A cylindrical member which pilots a differential housing to an end spindle during the welding thereof. The member is positioned such that as the center of gravity of an axle shaft passes into the spindle end during installation thereof, the leading end of the shaft is supported by the member.

3,715,936

DIFFERENTIAL BEARING PRELOAD LOCK

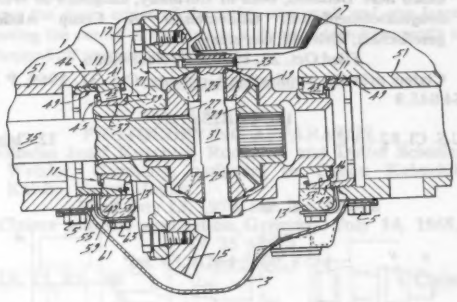
Evan L. Jones, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed April 5, 1971, Ser. No. 131,386

Int. Cl. F16h *1/40, 1/44*

U.S. Cl. 74—713 **10 Claims**

Automotive differential mechanism including rotatable bearing adjusters for applying a predetermined load on bearings mounting a two-piece differential case. Locking



members are provided for engaging the threads of the adjusters to inhibit rotation thereof.

3,715,937

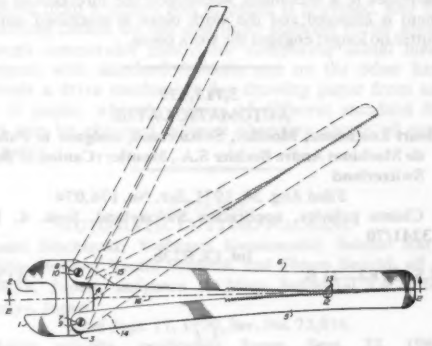
ANGULARLY ADJUSTABLE END WRENCH

James E. Cade, Phoenix, and Frank Mossuto, Scottsdale, both of Ariz., assignors to said Mossuto, by said Cade

Filed July 8, 1971, Ser. No. 160,848

Int. Cl. B25g *1/06*

U.S. Cl. 81—177.8 **1 Claim**



An end wrench is provided in which the angle between the nut receiving opening and the handle structure may be readily adjusted across a broad angle range. The handle comprises two separate pieces, each of which is individually, pivotally fixed to the head section symmetrically about a line bisecting the nut receiving opening. The inner edge of each handle portion is provided with serrations which are complementarily configured to interlock when the handle portions are clasped together. By manually separating the handle portions and moving them longitudinally with respect to one another, the angle of the head portion with respect to the handle may be adjusted to the angle desired whereupon the handle portions may be brought together to lock the head portion at the desired angle.

3,715,938
METHOD OF CONTROLLING A CYCLE OF OPERATIONS FOR MACHINING A ROTARY WORKPIECE

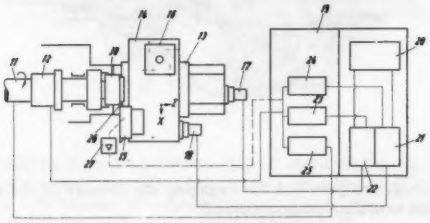
Alfred Ledergerber, Bielefeld, and Walter Plassmeier, Hiddesen near Detmold, both of Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp Aktiengesellschaft, Bielefeld, Germany

Filed Oct. 28, 1970, Ser. No. 84,856

Claims priority, application Germany, Oct. 31, 1969, P 19 54 845.9

Int. Cl. B23b *1/00*

U.S. Cl. 82—1 C **22 Claims**



A method for machining a rotary workpiece in radial and axial directions under the control of electronic program control means in which the maximum and minimum permissible reference values are stored, and which responds to signals of measuring devices representing the torque applied by the main spindle and workpiece to the cutting tool, advance rates of the tool, the cutting force, and other operational data. When the tool cuts into the workpiece, the increased torque is measured and the rate of rapid feed of the tool reduces, or the tool is stopped, so that the tool is freed of the workpiece, whereupon the tool is advanced so that the measured torque increases to a maximum, whereupon the direction of movement is changed and the work piece is machined until the cutter no longer engages the work piece.

3,715,939
AUTOMATIC LATHE

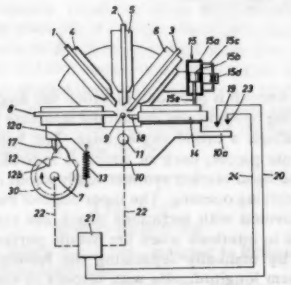
Henri Leschenne, Moutier, Switzerland, assignor to Fabrique de Machines Andre Bechler S.A., Moutier (Canton of Berne), Switzerland

Filed Aug. 30, 1971, Ser. No. 176,074

Claims priority, application Switzerland, Sept. 4, 1970, 13241/70

Int. Cl. B23b

U.S. Cl. 82—21 B **4 Claims**



An automatic lathe equipped with a mechanism rendering possible interruption of the rotation of a control shaft during a machining cycle, this control shaft being equipped with at least one cam disc fixedly seated thereon controlling the movement of given tools. There is provided at least one device for carrying out at least one working or machining operation by means of at least one predetermined tool during standstill of the control shaft. This device embodies at least one element for bringing about the feed of such predetermined tool and there is also provided a mechanism which controls the speed of feed movement of this tool or the duration of the machining operation carried out by such tool. There is additionally provided a response or feeler means, for instance a microswitch, and associated operable connection means in order to place again the control shaft into rotation as soon as the machining operation carried out by the aforementioned predetermined tool has been completed.

3,715,940
MACHINE FOR CUTTING ROD-LIKE ARTICLES INTO REQUIRED LENGTHS

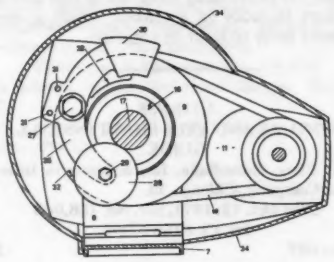
Lessel George Davis, Lurline Bay, New South Wales, Australia, assignor to Twentieth Century Blinds Pty. Limited, Undercliffe, New South Wales, Australia

Filed Dec. 7, 1970, Ser. No. 95,861

Claims priority, application Australia, Dec. 23, 1969, 65681/69

Int. Cl. B23b *5/14*

U.S. Cl. 82—63 **5 Claims**



A machine for cutting of the end of rod-like articles such as a rolled-up window shade. The article is held stationary and protrudes through a hole in the center of a flywheel, and a knife suspended from a lever pivoted on the flywheel cuts around the periphery of the article. A weight on the opposite end of the lever forces the knife against the flywheel by centrifugal action as the flywheel rotates.

3,715,941
SLITTING MACHINE

Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 8, 1971, Ser. No. 113,342

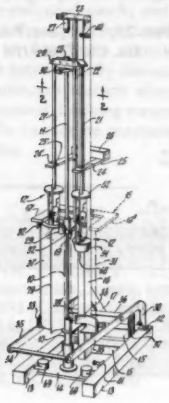
Int. Cl. B26d *3/08*

U.S. Cl. 83—7 **33 Claims**

The invention contemplates a tool and method for slitting a tubular work piece having a bore of substantially constant cross-section. To this end, a slitting-tool holder is provided with work-piloting body or positioning elements so sized and configurated as to stabilize the holder in the bore of the work piece during a working traverse. One or more slitting-tool elements is positioned on the holder so as to project, in a work-slitting position, radially outwardly of the body element at one angular location (or at plural angularly spaced locations) with respect to the longitudinal axis of the work piece. The working traverse is accomplished with the slitting tool in cutting position, with assurance of perfect alignment through piloting derived from the bore of the work piece.

In a specifically described employment, two slitting-tool elements are arrayed to project outward of diametrically opposed

locations, one element being adjusted to cut to less than work-piece thickness, the other being set to cut for greater than

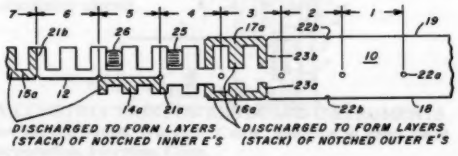


work-piece thickness. The work piece may thus become two hingedly related, substantially alike, elongated halves of the original tubing.

3,715,942
LIQUID SHAVING COMPOSITION AND METHOD OF SHAVING
Donald L. Courtney, Wilmington, Del., assignor to ICI America Inc., Wilmington, Del.
No Drawing. Filed May 31, 1968, Ser. No. 733,327
Int. Cl. A61k *7/14*
U.S. Cl. 83—22 **11 Claims**

Liquid shaving compositions comprising liquid, non-ionic surfactant and having an HLB from 1 to 9 and a viscosity from 0.1 to 50 stokes at 25° C. Method of shaving which comprises wetting the portion of the skin to be shaved, applying a liquid shaving composition of this invention onto the cutting edge of a razor to provide a thin layer thereon, and advancing the cutting edge of the razor over the dampened surface of the skin to sever the hair fibers.

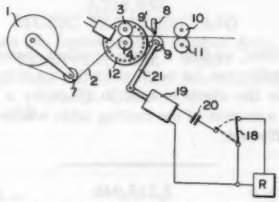
3,715,943
METHOD OF STAMPING LAMINATIONS
Robert K. Hirai, LaMiranda; John H. Boomer, and Edward R. Small, both of Fullerton, all of Calif., assignors to The Arnold Engineering Company, Marengo, Ill.
Filed June 2, 1971, Ser. No. 149,268
Int. Cl. B26d *1/00*
U.S. Cl. 83—50 **1 Claim**



The present invention is an improvement upon an earlier invention relating to a scrapless method of stamping E laminations from an endless strip of metal. The pattern in this particular method involves stamping small circular and semicircular apertures in the metal strip, respectively, at the regions where right angle die punches cluster and terminate at the edge of the metal strip so that there is no metal in the strip from which spurs may develop.

Also, this differs from the previous inventions whereby the inner E's were stamped out first, leaving the outer edges of the strip to be cut off as small and large E laminations. In this invention the patent changes as follows: Two E's are removed from the outer edges of the strip, one small and one large, leaving the center of the strip as a skeleton to subsequently to chopped off as small and large E's.

3,715,944
PHOTOCOPYING APPARATUS
Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed July 13, 1970, Ser. No. 54,512
Claims priority, application Germany, July 14, 1969, P 19 35 616.2
Int. Cl. B26d *5/00, 7/24*
U.S. Cl. 83—58 **4 Claims**

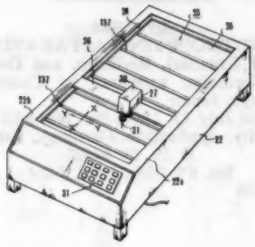


A photocopying apparatus in which the optical image of an original is formed with different dimensions on electrostatically charged paper, foil or like material. A means for measuring the length of photosensitive paper supplied from a supply roll of paper is provided, and this measuring means on the one hand controls cutter means through comparator means for comparing actual measurements with standard formats and on the other hand controls a drive mechanism for drawing paper from said roll of paper, whereby copies of different standard formats can be obtained without changing sheets of copying paper.

3,715,945
AUTOMATIC CUTTING MACHINE
Takashi Mochizuki; Yoshinori Komasuzaki; Satoshi Hara; Hideo Nojima; Tamio Shimizu, and Shigeo Suzuki, all of Tokyo, Japan, assignors to Muto Industrial Co., Ltd., Tokyo, Japan
Filed Sept. 17, 1970, Ser. No. 73,016
Claims priority, application Japan, Sept. 22, 1969, 44/90672; Oct. 31, 1969, 44/103457; Nov. 23, 1969, 44/110919; Jan. 16, 1970, 45/4979; Jan. 24, 1970, 45/7702; March 19, 1970, 45/26353; March 19, 1970, 45/26354; March 25, 1970, 45/28039; April 14, 1970, 45/35921; April 14, 1970, 45/35920; Dec. 16, 1969, 44/101139; Jan. 24, 1970, 45/6447; Jan. 26, 1970, 45/6880; Feb. 12, 1970, 45/12186; Feb. 12, 1970, 45/12187; March 25, 1970, 45/24642; April 15, 1970, 45/31597; April 28, 1970, 45/36521; April 28, 1970, 45/36522; June 27, 1970, 45/56169The portion of the term of this patent subsequent to 15, 1970, 45/31597; April 28, 1970, 45/36521; April 28, 1970, 45/36522; June 27, 1970, 45/56169, has been disclaimed.
Int. Cl. B26d *1/04*; B23d *27/00*
U.S. Cl. 83—71 **4 Claims**

An automatic cutting machine comprising a cutting table made of a spray material or brush-like fine hair, and a carriage

mounting a cutting device comprising a cutter and adapted to move parallel to the upper surface of the cutting table. The carriage is operatively associated with a numerical control system and moves in a predetermined directions while the cutter moves up and down in reciprocating motion to cut into



the cutting table, so that a cloth or other material placed on the cutting table can be automatically cut into any shape as desired while the cloth is held in place by a suction force produced in a section of the cutting table where cutting of the material is effected.

3,715,946

FEED CONTROL APPARATUS FOR A ROTARY TOOL

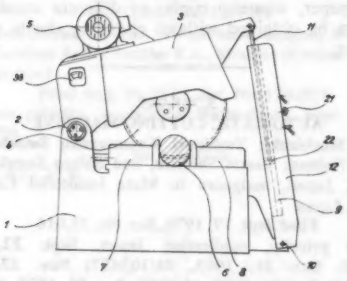
Dieter Kaltenbach, Rebweg 33, 7850 Lorrach, Germany

Filed Sept. 15, 1971, Ser. No. 180,654

Claims priority, application Germany, Sept. 17, 1970, P 20 45 930.7

Int. Cl. B26d *5/12*

U.S. Cl. 83—72 **10 Claims**



A saw blade is rotated by an electric motor while fed by a hydraulic feeding motor into a workpiece. A regulating throttle controls the hydraulic motor to vary the feeding speed, and is operated by a control means to either slowly increase the feeding speed or to rapidly reduce speed in accordance with the indications of a torque responsive amperemeter in the circuit of the electric motor. Two manually settable stops limit the movement of the regulating throttle independently of the control means and of the indication of the amperemeter in two end positions in which the hydraulic feeding motor is set to a maximum and a minimum feeding speed, respectively, selected for a specific workpiece.

3,715,947

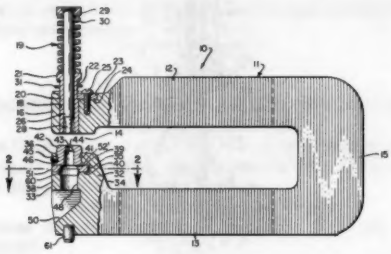
PERFORATING DEVICE

Ralph L. Weisbeck, Buffalo, and Dennis Daniels, Williamsville, both of N.Y., assignors to Unipunch Products, Inc., Buffalo, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,583

Int. Cl. B26f *1/14*

U.S. Cl. 83—140 **4 Claims**



A perforating device of improved construction is disclosed comprising a C-shaped holder having an upper arm carrying the usual punching and stripping assembly and a lower arm which is provided with a horizontal slot to leave a portion of this lower arm above the slot to embrace the usual die button about its full circumference, an apertured plate-like member composed of a harder material than the holder being removably arranged in said slot to provide an upwardly facing annular seat for the die button, this member backing up the die button and being in turn supported over a larger area on the lower portion of said lower arm which thereby acts as a base for said member.

3,715,948

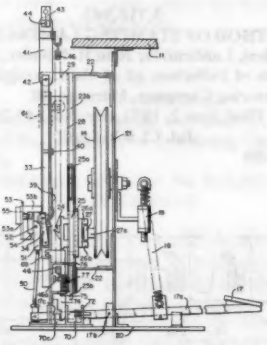
MECHANICAL POWER ASSIST APPARATUS

Janis Liepings, 427 North Huron, Pierre, S. Dak.

Filed June 30, 1971, Ser. No. 158,190

Int. Cl. B26d *5/10*

U.S. Cl. 83—573 **10 Claims**



A power assist for a hand-operated punching machine comprises an output bar mounted for reciprocating movement, and normally spring-biased to a predetermined quiescent position. A motor-driven pulley continuously operates to reciprocate a catch mechanism along a straight line path parallel to the normal direction of extension of the output bar; and the output bar is in turn provided with a pivotally mounted catch which is normally spring biased to a position

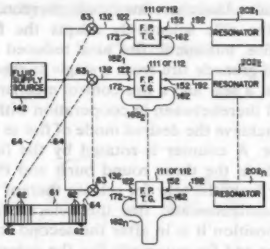
spaced from the path of movement of the power driven catch. A treadle mechanism is provided for selectively repositioning the pivotally-mounted catch so that it engages the power-driven catch when said power-driven catch next passes the location of said pivotally-mounted catch; and this engagement between catches causes the output bar assembly to be driven upwardly in a power stroke. Upon completion of a single power stroke, the catch automatically disengages, and the output bar returns to its quiescent position where it remains until the treadle is again depressed. Locking means are provided for assuring that the treadle cannot be reactuated during occurrence of the power stroke.

3,715,949

MUSICAL INSTRUMENT USING A FLUID POWERED TONE GENERATOR FOR GENERATING SONIC ENERGY

Akihiko Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Feb. 16, 1972, Ser. No. 226,875
Claims priority, application Japan, Feb. 18, 1971, 46/7,167, 46/7,168
Int. Cl. G10d *7/00*
U.S. Cl. 84—330 **18 Claims**



A musical instrument using a fluid powered tone generator wherein the oscillating frequency is determined by the length and inner diameter of a looped frequency-determining fluid-passing tube connected to the main fluid passageway of the oscillator of the tone generator to control the main flow of the fluid. Variation of oscillating frequencies can be obtained by slidingly varying the length of the frequency-determining tube; by arranging a plurality of fluid oscillators having, respectively, varied lengths of frequency-determining tubes, in an order corresponding to a predetermined order of musical notes, so that they are selectively controlled, for example, by a keyboard; or by coupling a plurality of parallel connected frequency determining tubes to a fluid oscillator and selectively controlling insertion of one of the tubes in the oscillator circuit.

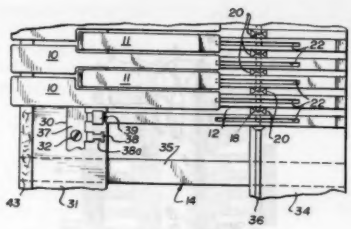
3,715,950

KEY CONSTRUCTION FOR KEYBOARD INSTRUMENTS

Albert W. Nordquist, Ivoryton, Conn., assignor to Pratt-Read Corporation, Ivoryton, Conn.

Filed Sept. 22, 1971, Ser. No. 182,693
Int. Cl. G10c *3/12*
U.S. Cl. 84—433 **8 Claims**

A key for keyboard instruments includes a key cap member mounted on an elongated key stick made of uniform material, such as wood. A transverse notch is formed in the key stick to receive a pivotal portion of a pivot-spacer member which has upstanding spacer portions on either side of the key stick in the region of the notch. A slot is also formed in the key stick in the region of the notch so as to make the same more flexible in a transverse direction thus allowing the key to engage the spacers and sufficient resiliency of the key stick will prevent sticking of the key to the pivot-spacer member.

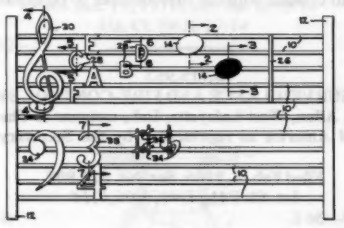


3,715,951

MUSIC TEACHING AID

Clara M. Lanaro, 1002 Pepper Ave., Sunnyvale, Calif. 94087

Filed June 30, 1971, Ser. No. 158,392
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 **2 Claims**



A music teaching aid including a plurality of wires supported by a frame in spaced parallelism to simulate the appearance of a musical staff together with note members, clef-identifying members, note-identifying members, measure-indicating members, sharp and flat-indicating members and musical time-indicating members arranged for removable connection to the wire staff members, thus to simulate a musical score.

3,715,952

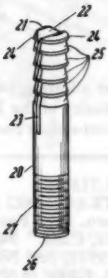
EXPANSION ANCHOR UNIT

Artur Fischer, Altheimer Str. 219, Tumlingen, Germany

Filed March 27, 1970, Ser. No. 23,339
Claims priority, application Germany, Sept. 19, 1969, P 19 47 369.9
Int. Cl. F16b *13/06*
U.S. Cl. 85—68 **9 Claims**

An expansion anchor unit has a first member a leading portion of which is provided with cutter edges for drilling a hole in a support structure, and a trailing portion of which converges in direction away from the leading portion. A second member is provided with a forward end portion matingly engageable with the trailing portion of the first member, and with a rearward end portion engageable by a tool which is operative for jointly rotating both of the members in a sense effecting drilling of a hole in a support structure by the cutter edges. The second member may itself be configurated as an expansion member to be expanded by the first member after the

latter has drilled the hole in the support structure, or an additional expansion member may be provided which, after the second member is disengaged from the first member and



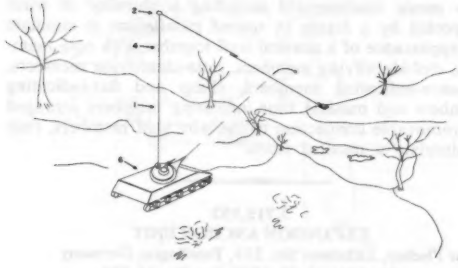
removed from the hole, is inserted into the hole and forcibly wedged into contact with the first member to be expanded by the same.

3,715,953

AERIAL SURVEILLANCE AND FIRE-CONTROL SYSTEM

William L. Allan, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 4, 1966, Ser. No. 525,802
Int. Cl. F41g *1/40, 3/06, 7/14*
U.S. Cl. 89—36 L **6 Claims**



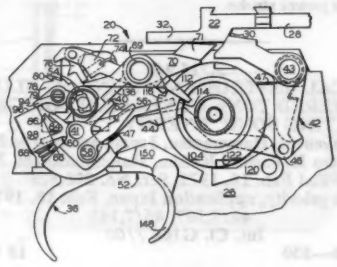
An aerial surveillance and fire-control system including an elevatable fire-control and scanning section and a control console mounted in a combat vehicle. The scanning section is defined by a TV camera, a pulsed laser rangefinder/illuminator, and an azimuth readout device, all mounted on a three-axis, rate-stabilized platform. A protective, but transparent, housing is provided for the scanning section, and this housing, when retracted, is seated in a mating compartment in the roof of the vehicle. A coilable, extendible type mast is provided for raising and lowering the scanning section. A cable-reel assembly disposed adjacent the coiled mast within the vehicle supplies the electrical cable within the mast.

3,715,954

FIRING MECHANISM FOR A MULTI PURPOSE FIREARM

Edward T. Rude, Jr., Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 31, 1971, Ser. No. 176,417
Int. Cl. F41d *11/02*
U.S. Cl. 89—127 **14 Claims**



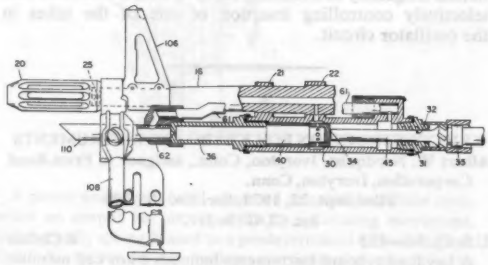
A firearm having both point and area fire power comprises a rifle and grenade launcher mounted thereon. A firing mechanism in the rifle selectively adapts the firearm for semiautomatic fire, automatic fire at a reduced rate, three round bursts and grenade fire from a single trigger and comprises the trigger, a sear and a fire control mechanism operationally disposed therebetween in cooperation with a reciprocal firing pin to achieve the desired mode of fire as selected by a rotary selector. A counter is rotated by the firing pin to count the rounds in the three round burst and then disconnects the trigger from the sear for release thereof to hold the firing pin. In semiautomatic fire the selector rotates the counter to the position it is in after the second round of the three round burst and for automatic fire the automatic volley commences as with the semiautomatic fire and then continues until the trigger is released with an inertia wheel momentarily stopping the operation of the rifle after each round and then actuating the sear for release of the firing pin. For launcher fire, the selector disconnects the trigger from the sear and connects it to an arm linking the trigger to the launcher.

3,715,955

MACHINE GUN GAS ACTUATING AND EVACUATION SYSTEM

Cranston Wesley Folley, Kennebunk, Maine, and John Gonsalves Rocha, Westfield, Mass., assignors to Maremont Corporation, Chicago, Ill.

Filed Feb. 12, 1970, Ser. No. 10,927
Int. Cl. F41d *5/10*; F41h *7/12*
U.S. Cl. 89—193 **5 Claims**



In a machine gun having a gas-actuating system including a gas cylinder responsive to gas pressure generated by the discharge of a round and including a receiver and a barrel

mounted therein having a predetermined bore and a muzzle, a novel gas evacuation means, a novel barrel extension means and a novel gas seal means all for removing exhausted gas from the area surrounding the machine gun receiver, gas cylinder and receiver. The novel gas evacuation means, mounted on the gas cylinder and along the barrel, is in communication with the gas-actuating system for removing exhausted gas therefrom and conveying said exhausted gas for discharge at a location remote from the muzzle; the novel barrel extension is attached to the muzzle of the barrel, has a bore greater than the barrel bore for removing exhausted gas from the muzzle and conveying said exhausted gas for discharge at a location remote therefrom free from interference with the operation of the gun mechanism; and the novel gas seal means includes an obturating nut and sealing collar provided in the gas-actuating system for preventing exhausted gas from passing rearwardly therethrough and escaping from the receiver.

3,715,956

MACHINE TOOL FOR CUTTING LONGITUDINAL GROOVE IN CYLINDRICAL WORK PIECE

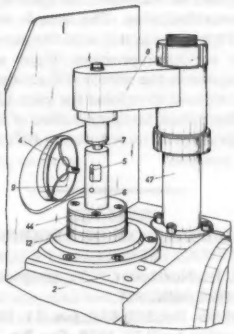
Karl Lieser, Wuppertal-Elberfeld, Germany, assignor to Firma Hermann Werner, Wuppertal-Hahnerberg, Germany

Filed April 24, 1970, Ser. No. 31,616

Claims priority, application Germany, April 26, 1969, P 19 21 514.6

Int. Cl. B23c *3/28*

U.S. Cl. 90—20 **8 Claims**



A machine tool for forming longitudinal grooves in a cone apex of cross slot-engine lathes or similarly designed work pieces, and retaining a work piece in a clamping chuck, and a rotating cutter tool. The latter cuts into the work piece in longitudinal direction of the latter. The cutter tool comprises a fly cutter. Means are provided for continuous rotation of the work piece. The cutter tool cuts into the work piece.

3,715,957

APPARATUS FOR COMPACTING FILTER TIP ASSEMBLIES

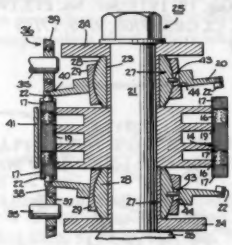
Floyd V. Hall, Durham, N.C., assignor to Liggett & Myers Incorporated, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,802

Int. Cl. B31d *3/00;* **A24c** *5/48*

U.S. Cl. 93—1 C **21 Claims**

The plates contain pressure pads about the peripheries and each is mounted in angular relationship to the cigarette transfer drum and is rotatable along with the transfer drum. The pressure pads are arranged in opposed pairs to converge towards each other as the plates rotate so as to compact



charges of granular material within a multi-section filter tip assembly located at the point of conveyance.

3,715,958

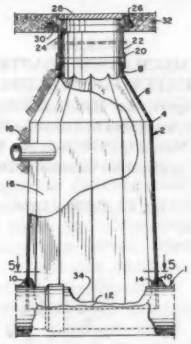
PREFORMED MANHOLE BODY

David D. Crawford, 1601 North Oak Street, Mineral Wells, Tex., and John W. Elvington, 4105 Kingbury, Wichita Falls, Tex.

Filed Jan. 19, 1971, Ser. No. 107,776

Int. Cl. E02d *29/14*

U.S. Cl. 52—21 **6 Claims**

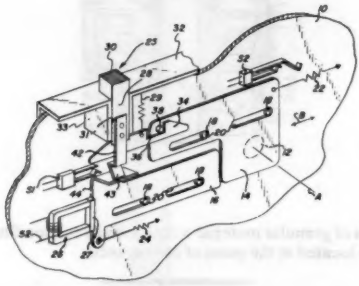


A manhole body which is preformed of plastic or concrete and reinforced to withstand the weight exerted by the ground and outside sources of water, which manhole body may be of a size and shape to fit on a sewer line of any size and depth, with the sleeve extending to the surface so as to give access into the manhole body which has a suitable cover therefor. The manhole bodies are of unitary, tapered construction and are so designed as to fit in telescoped relation to conserve room during shipping or storage. Transverse semi-circular notches are formed in the lower side of each manhole body so as to fit the upper contour of a sewer line, so when a cementitious material, such as concrete, is poured to seal the bottom and sides of the manhole, the top portion of the sewer line, above the concrete, may be broken away to provide a sewage outlet from the manhole body and access to the sewer line admit cleaning tools.

3,715,959
APPARATUS FOR PROVIDING SHUTTER RELEASE AND FOR INDICATING END OF A CONTROLLED TIME EXPOSURE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,196
Int. Cl. G03b 7/08, 9/16, 17/18
U.S. Cl. 95—10 CT 5 Claims

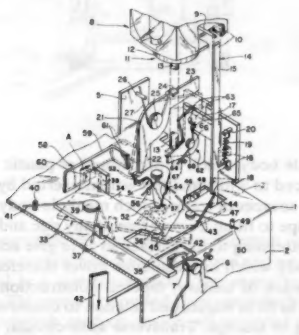


Apparatus for actuating a camera shutter to uncover an exposure aperture, for actuating switch means, and for indicating the end of a controlled time exposure, including a shutter actuating member movable from a first position to a second position for actuating the shutter to uncover the exposure aperture. The shutter actuating member is retained in the second position during a controlled time exposure, and is released for return movement to the position in response to the actuation of the shutter to cover the exposure at the end of the controlled time exposure. The returning of the shutter actuating member to the first position indicates the end of the controlled time exposure.

3,715,960
CAMERA MECHANISM ADAPTED TO FIRE MECHANICALLY-ACTUABLE FLASH UNITS

Horst Simon, Stuttgart, and Heinrich Killgus, Kornwestheim, both of Germany, assignors to Eastman Kodak Company

Filed Nov. 27, 1970, Ser. No. 93,325
Claims priority, application Germany, Dec. 4, 1969, P 19 60 843.6
Int. Cl. G03b 15/04
U.S. Cl. 95—11.5 R 1 Claim

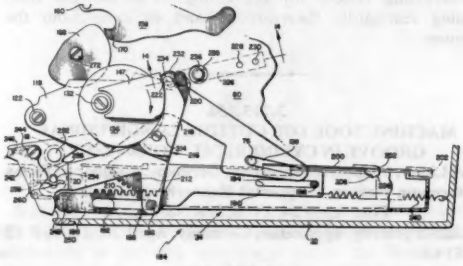


A camera mechanism adapted to receive mechanically-actuable multilamp flash units has a pre-energized flash actuator bar which is released by operative movement of the shutter actuator and is propelled to extend partially from the camera body to operate a mounted flash unit. A pre-energized retracting member is subsequently released by the shutter actuator to return the flash actuator bar to its pre-energized position within the camera body. Rotation of the flash unit, to position a fresh lamp, is thus facilitated and the possibility of damaging the actuator bar is reduced.

3,715,961
REFLEX MEMBER POSITIONING MECHANISM

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corp., Cambridge, Mass.

Continuation-in-part of Ser. No. 67,051, Aug. 26, 1970. This application Dec. 20, 1971, Ser. No. 209,711
Int. Cl. G03b 19/12
U.S. Cl. 95—42 20 Claims

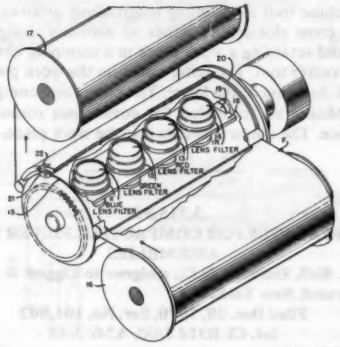


A reflex camera in which the mirror is driven by a spring gear wound by a motor. The spring gear transmits power by shaft 132 to the cam 136. Arm 118 is connected by a pin to a grove inside the cam so that when the cam is rotated, the arm will rotate counterclockwise. The arm is connected to the reflex member 70 and the rotation of the arm raises the reflex member to the exposure position. Upon completion of a photographic exposure, the motor will rotate the profile cam 168 a sufficient amount to release the cam 136 from its exposure position. Thereafter, further rotation of the cam 136 is effected by the spring gear to return the reflex member to the normal viewing position.

3,715,962
SPECTRAL-ZONAL COLOR RECONNAISSANCE SYSTEM

Edward F. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corporation, Hicksville, N.Y.

Continuation of Ser. No. 519,854, Jan. 11, 1966, abandoned. This application April 20, 1970, Ser. No. 30,199
Int. Cl. G03b 7/00
U.S. Cl. 95—12.5 7 Claims



Multiple images of a common scene are formed by exposure of photographic film primarily to separated zones of the actinic electromagnetic spectrum. The several film images are il-

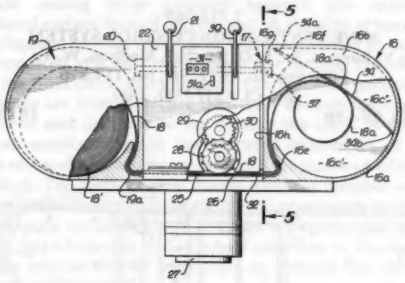
luminated individually with lights of selected chromaticities. The chromaticity of the light illuminating at least one of the images is widely separated from the chromaticity associated with the corresponding exposing spectral zone for that image. The illuminated images are displayed in registration for evaluation.

3,715,963

FILM TAKE-UP MAGAZINE AND ATTACHMENT ASSEMBLY THEREFOR

Maurice LeCover, 145 South Arden Boulevard, Los Angeles, Calif.

Filed Sept. 3, 1971, Ser. No. 177,682
Int. Cl. G03b *17/22*
U.S. Cl. 95—31 C **8 Claims**



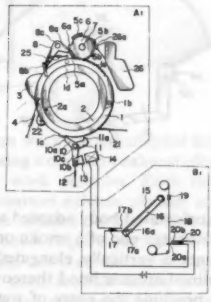
A film take-up magazine includes a flat spring extending across the magazine interior. As additional convolutions of exposed film accumulate in the magazine, tangential film-spring contact displaces the spring to increase the effective size of the film receiving chamber. The magazine is attached to a camera by an assembly including a lever operated latch. The same lever moves a knife edge plate to sever the exposed film and to cover the film exit aperture when the magazine is detached from the camera.

3,715,964

LENS SHUTTER CONTROL MECHANISM FOR A SINGLE LENS REFLEX CAMERA

Shohei Tenkumo, Saka-shi, Osaka-fu, and Takeshi Egawa, Kainan-shi, Wakayama-ken, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan

Filed Sept. 17, 1970, Ser. No. 73,134
Claims priority, application Japan, Sept. 17, 1969, 44/73230
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **3 Claims**



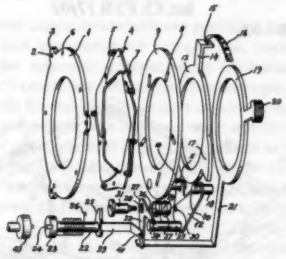
A lens shutter control mechanism includes an operating member movable between a first and second cocked position in accordance with the actuation of an electromagnetic means whereby a shutter blade member is respectively opened and closed with said operating member respectively in said first and second cocked position. A latch member actuated by the electromagnetic means retains the operating member in the second cocked position. The actuation of the electromagnetic means is determined by the operation of two switches which are operated in accordance with the movement of a mirror between a viewing position and a picture taking position.

3,715,965

PRESET DIAPHRAGM FOR INTERCHANGEABLE LENSES OF SINGLE-LENS MIRROR REFLEX CAMERAS

Alf Ingvar Alfredsson, Savedalen, Sweden, assignor to Fritz Victor Hasselblad

Filed Dec. 9, 1970, Ser. No. 96,560
Claims priority, application Sweden, May 6, 1970, 6,236/70
Int. Cl. G03b *9/07*
U.S. Cl. 95—64 B **8 Claims**



A preset diaphragm for an interchangeable lens of a single-lens mirror reflex camera in which the diaphragm is controlled by a mechanism in the camera body having a shaft detachably coupled in the edge of the lens mount which rotates in one direction during release of the camera and in the opposite direction during film transport and this rotational movement is transferred to a shaft in the lens which opens and closes the preset diaphragm by turning the diaphragm cover. Specifically, the shaft in the lens carries a cam disc which is spring-loaded and pivotally mounted on one leg of an angle lever. The other leg of the angle lever is resiliently connected with a guide plate for the diaphragm cover. In operation, the angle lever and guide plate are turned relative to one another when the guide plate movement is stopped at the preset aperture value thus allowing the cam disc to complete its rotation by the mechanism in the camera body.

3,715,966

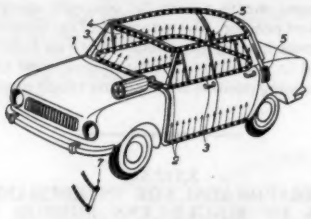
LAPPING ANTICONDENSATION VENTILATION FOR WINDOWS OF VEHICLES

Tuure Tapio Miettinen, Oulu, Finland

Filed Apr. 30, 1971, Ser. No. 138,970
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.18 **6 Claims**

A lapping anticondensation ventilation system to prevent the condensation of moisture on the windows of vehicles, thus improving the traffic safety and the convenience of motoring. The lapping system uses for ventilation of windows fresh, normally heated air, the relative humidity of which will not increase upon its admixture

with exhaled air. The flow will take place along the windows by the shortest path under a pressure gradient



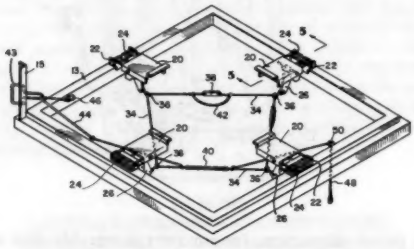
produced by an air distribution channel running around the lower edges of the windows and by a suction channel.

3,715,967

POWER ROOF EXHAUSTER OR HEAT RELIEF VENT

Thomas R. Field, Indianapolis, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed March 22, 1971, Ser. No. 126,672
Int. Cl. F23l 17/02
U.S. Cl. 98—42 **4 Claims**



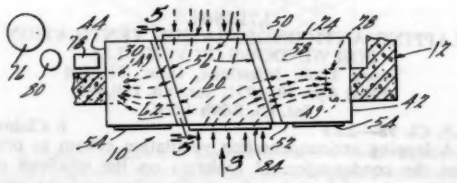
This invention relates to a power roof exhauster or a heat relief vent having spring loaded release mechanism which, in response to high temperatures such as caused by fire, is caused to release for opening side louvers on the exhauster or vent. The release mechanism is triggered by the melting of a heat fusible link or by manual release.

3,715,968

AIR CURTAIN STRUCTURE

Artel R. Henson, Pontiac, Mich., assignor to Disco Engineering, Inc., Detroit, Mich.

Filed Feb. 12, 1970, Ser. No. 10,812
Int. Cl. F24f 9/00
U.S. Cl. 98—36 **17 Claims**



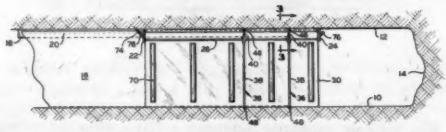
An air curtain structure for providing a flow of air across an access opening to a building or the like and comprising an enclosure adjacent the upper end of the opening and a pair of downwardly extending support columns arranged adjacent the sides of the opening and defining a pair of opposed air discharge slots; the enclosure being provided with a pair of heat exchanger coil assemblies adapted to condition air preparatory to the same being communicated to the support columns; at least one air blower mechanism for forcing air in heat transfer relation with the coil assemblies, and a pair of air inlet assemblies, one of which is adapted to induct air from the interior of the building into the enclosure and the other of which is adapted to induct fresh outside air from the exterior of the building into the enclosure, with the air intake assemblies being provided with closure means for selectively opening and closing the same, whereby to permit either the induction of fresh outside air and/or the recirculation of air inside the building through the heat exchanger coil assemblies.

3,715,969

MINE VENTILATION CONTROL SYSTEM

James V. Burgess, Jr., P. O. Box 385, Madison, W. Va.

Filed Feb. 26, 1971, Ser. No. 119,270
Int. Cl. E21f 1/00, 3/00
U.S. Cl. 98—50 **10 Claims**



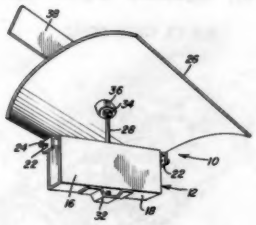
A mine ventilation control system for directing air flow in the immediate region of the working face of a mine, including an extensible curtain assembly which can be readily mounted adjacent the end of a line curtain and advanced toward the working face of the mine at a rate commensurate with the removal of the material being mined.

3,715,970

DEVICE FOR ENHANCING GAS DISCHARGE

Fernando Cano, 1300 Libertad, Chihuahua, Mexico

Filed March 25, 1971, Ser. No. 128,050
Int. Cl. F23l 17/02
U.S. Cl. 98—70 **2 Claims**

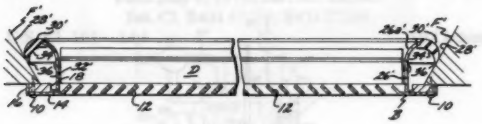


A vertically orientated body adapted to be clamp-mounted to the upper discharge end of a smoke or gas stack. The body rotatably mounts a vertically elongated shaft which incorporates an inclined arcuate hood thereover adapted to cover the stack and preclude the entry of water and down drafts. The hood is wind orientated through a vertical wind vane affixed thereto whereby the upper discharging portion thereof is always located downwind.

3,715,971
HOT AIR REGISTER

Lillian R. Moyer, 9925 Domering Road, Downey, Calif.

Filed Jan. 19, 1970, Ser. No. 3,633
Int. Cl. F24f 13/00
U.S. Cl. 98—110 3 Claims

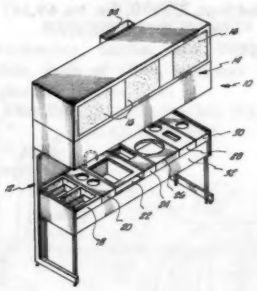


A hot air register of the type that includes a vertically baffled front piece that is secured to a wall in communication with the outlet of a hot air duct therein. The front piece has a resilient sealing strap disposed between the rearward peripheral surface thereof and the wall. A plurality of horizontally disposed louvers that are pivotally adjustable in unison are supported in a rigid sheet frame that extends rearwardly from the front piece into said duct. The rearward portions of said frame are formed to flare outwardly towards the interior surface of said duct but do not contact the same. A slotted resilient member engages the rearward extremities of said frame and is also in sealing contact with the interior surface of said duct. The resilient strip, frame, resilient member and a portion of the interior surface of said duct cooperate to define a dead space into which soot and dust are discharged by the hot air, and which soot or dust would otherwise be discharged laterally relative to said front piece to discolor the wall adjacent to said register.

3,715,972
CLEAN WORK STATION

Francis Kelso, Los Angeles, and Arnold J. Gustin, Glendale, both of Calif., assignors to Integrated Air Systems, Inc., Burbank, Calif.

Filed May 28, 1971, Ser. No. 147,774
Int. Cl. F23j 11/00
U.S. Cl. 98—115 LH 9 Claims

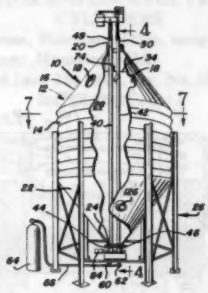


A laminar flow clean work station adapted for rapid change in work setup by utilizing a common exhaust plenum and drain and interchangeable work modules. Each module empties separately into the common exhaust plenum and drain. Each module has a separate exhaust damper which is adjustable to suit the particular exhaust requirement of the work to be undertaken at the module. Air is exhausted through the series of apertures formed in each module below a work receiving opening the station work surface. The opening forms a lip overhanging the module work receiving space and has a depending flange to further baffle the apertures from the station work surface.

3,715,973
APPARATUS FOR HEATING GRAIN OR THE LIKE

Eugene G. Sukup, Dougherty, Iowa

Filed July 13, 1970, Ser. No. 54,374
Int. Cl. B01d 7/16
U.S. Cl. 99—235 R 25 Claims

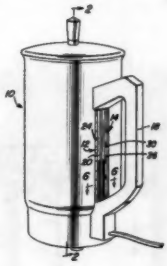


A pair of vertical auger conveyors are provided in one compartment of a dual compartment storage bin, and a return guide tube in the opposite compartment. A burner at the lower end of each conveyor effects combustion upward along the conveyor walls for heating grain as it moves up each auger conveyor. Raw grain from one compartment enters the lower end of one auger conveyor and is partially heated as it ascends this conveyor, then free-falls through the guide tube to the lower end of the second auger conveyor, and is heated further as it is moved upward in the second conveyor from whence it is discharged to the second compartment. The burners are controlled in response to the temperature of the grain to obtain the desired heating.

3,715,974
ABBREVIATED CYCLE COFFEEMAKER

James H. Beverett, 410 Nottingham Road, Montgomery, Ala.

Filed June 1, 1971, Ser. No. 148,709
Int. Cl. A47j 31/00
U.S. Cl. 99—285 8 Claims

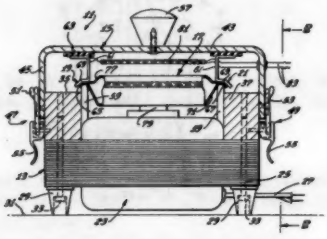


A percolator type coffeemaker incorporating combined water and temperature level indicators correlated so as to provide an automatic indication of the initial water temperature required to brew a predetermined amount of coffee within a specific time. A basket insert is utilized to insure a proper and rapid flow through the ground coffee to insure a complete extraction therefrom within the abbreviated cycle achieved by utilizing specifically preheated water.

3,715,975
FOOD HEATING DEVICE

Leonard Tony King, Long Beach, Calif., assignor to Speedline Partnership, San Francisco, Calif.

Continuation-in-part of Ser. No. 48,209, June 22, 1970, which is a continuation-in-part of Ser. No. 629,315, April 7, 1967, abandoned. This application May 11, 1971, Ser. No. 142,243
Int. Cl. A47j 27/62
U.S. Cl. 99—331 17 Claims

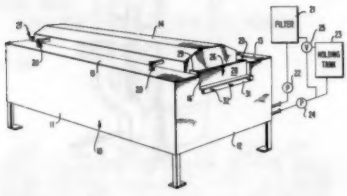


A food heating device for heating and cooking food items such as TV-dinners that are prepackaged in standard electrically conductive containers. A rigid secondary winding from a step-down transformer supports the opposed ends of the conductive food package for passing a high current directly through the food package and at least some of the food contained therein for rapidly and efficiently heating the food. Resistance and reactance losses are minimized by holding the container close to the transformer and by assuring a low resistance connection to the container. Means are provided for assuring uniform heating of the container contents and for sensing the average temperature of the container.

3,715,976
COMMERCIAL FOOD FRYER AND METHOD OF CLEANING

John F. Krakowski, Rehoboth Beach, Del., assignor to Mark 7 Seafood and Industries, Inc., Houston, Del.

Filed Oct. 18, 1971, Ser. No. 190,116
Int. Cl. A47j 37/12
U.S. Cl. 99—404 9 Claims

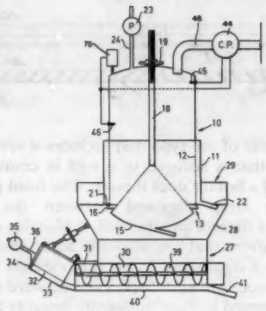


Readily detachable gasketed extension panels are secured to the infeed and discharge ends of a continuous-type fryer for fish or like food products. The extension panels permit flooding of the fryer with cleaning liquid to a level above the food conveyor so that the latter is totally immersed during cleaning and laborious scrubbing and scouring is eliminated.

3,715,977
JUICE EXTRACTING DEVICE

John Mackenzie, Adelaide, Australia, assignor to Jack Sinclair, Adelaide, South Australia, Australia, part interest

Filed Dec. 1, 1970, Ser. No. 94,001
Int. Cl. B30b 9/14
U.S. Cl. 100—117 5 Claims

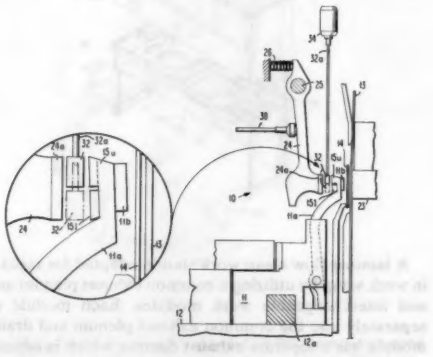


A device for extracting fruit juice from crushed fruit wherein the epidermal cells of the crushed fruit are driven through a perforate conduit and have pressure applied to them to express juice from them, the device comprising a primary extraction container, a secondary extraction container having an auger with drive means coupled thereto, a perforate member beneath the auger, a perforate conduit constituting an extension of the perforate member, imperforate juice collecting means beneath both the perforate member and perforate conduit, and a discharge opening in the perforate conduit, the discharge opening containing restriction means so that pressure is built up on the epidermal cells by driving of the auger, the perforate conduit varying in direction so that the epidermal cells when being driven there-through have pressure reduced on them and then reapplied.

3,715,978
PRINTER HAMMER MECHANISM

Jerry W. Raider, Endicott, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,317
Int. Cl. B41j 1/20, 9/14
U.S. Cl. 101—93 C 2 Claims



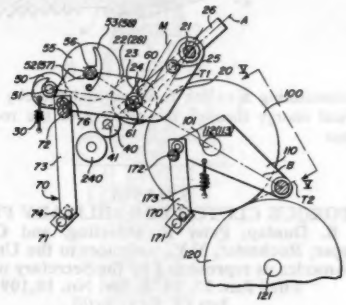
A printer has a type cartridge with a plurality of character-bearing type levers, alternate levers having faces on the back at different levels. Print hammers for each print position have striking faces covering both levels, and selection of the type levers is made by operating an interposer between the printer hammers and type levers to the desired level.

3,715,979

OFFSET PRINTING MACHINE

Edgar Erb, Leitershofen; Walter Habiger, Mohringen; Willi Kramer, Zuffenhausen; Wolfgang Pfeil, Kornwestheim, and Reinhold Weigele, Muenchingen, all of Germany, assignors to Fortuna-Werke Maschinenfabrik Aktien gesellschaft, Stuttgart-Bad Cannstatt, Pragstrasse, Germany

Filed July 9, 1970, Ser. No. 53,547
Int. Cl. B41f *31/34*; B41l *27/36*
U.S. Cl. 101—144 10 Claims



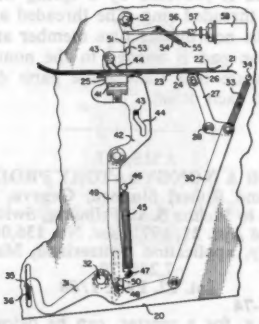
A printing machine of the offset type in which a foil covered roller is engageable with a rubber cloth covered roller to supply printing material thereto, while an application roller engages the foil covered roller to apply printing material thereto. Both the foil covered roller and the application roller are supported for tilting movement so the foil covered roller can be moved toward and away from the rubber cloth covered roller, while the application roller can be moved toward and away from the foil covered roller. Frames supporting the foil covered and application rollers are tiltable about respective axes lying substantially in the common tangential plane of the line of contact of the respective roller and the roller relative to which it is tiltable. The machine includes a supply of printing material contained in a reservoir formed by a ductor roller and a counter roller adjustably pressed together. The ductor roller is unidirectionally driven in adjustable steps to draw printing material from the reservoir.

3,715,980

REINKING MECHANISM

Louis E. Zurbuchen, Dayton, and William R. Bradam, New Carlisle, both of Ohio, assignors to The National Cash Register Co., Dayton, Ohio

Filed Dec. 28, 1970, Ser. No. 102,007
Int. Cl. B41k *1/42*
U.S. Cl. 101—333 6 Claims



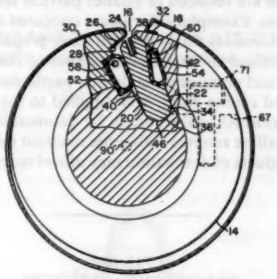
A printing and reinking mechanism which includes a member supporting a printing element and adapted for movement in a printing direction, means for selectively controlling the movement of the support member in a printing direction, a reinking member adapted for movement to a position engaging the printing element and actuating means for moving said printing element and the reinking member to provide a reinking operation and a printing operation.

3,715,981

FLUID ACTUATOR AND LOCK FOR PRINTING PLATE CYLINDERS

Harold W. Huffman, Hamilton, Ohio, assignor to The Hamilton Tool Company, Hamilton, Ohio

Filed June 29, 1970, Ser. No. 50,642
Int. Cl. B41f *27/12*
U.S. Cl. 101—415.1 15 Claims



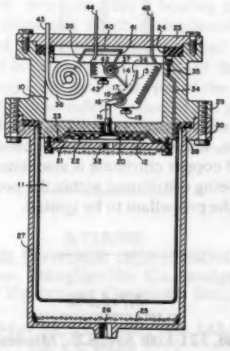
The printing cylinder is provided with an internal inflexible clamp bar rockingly mounted, for movement selectively either to an operative plate-clamping position or to an inoperative plate-releasing position, by means of a foot-controlled valve for enabling the pressman to utilize both of his hands exclusively for accurate positioning of the printing plate upon the cylinder.

3,715,982

PRESSURE ARMING DEVICE

Harvey C. Hayes, Washington, D.C., and Horace M. Trent, Alexandria, Va. (both % Naval Research Laboratory, Washington, D.C. 20020)

Filed Dec. 3, 1946, Ser. No. 713,730
Int. Cl. F42b *21/38*; F42c *13/00*
U.S. Cl. 102—18 6 Claims



5. An arming device for underwater mines comprising a source of electrical power, a mine power supply circuit, a normally open control circuit, relay means responsive

to closure of said control circuit to connect said power circuit to said source, means responsive to a drop in pressure to close said control circuit, a first timing means operable to open said power circuit after a given time and a second timing means operable upon opening of the power circuit to block operation of the control circuit for a given time.

3,715,983

EXPLOSIVE FRAGMENTATION OF POROUS SOLIDS

Edward J. Rosinski, Deptford, N.J., assignor to Mobil Oil Corporation

Division of Ser. No. 828,723, May 28, 1969, Pat. No. 3,620,965. This application Nov. 3, 1970, Ser. No. 86,608

Int. Cl. F42d *1/00*

U.S. Cl. 241—1 4 Claims

Porous solids having surface area of at least five square meters per gram are reduced to smaller particle size by explosive fragmentation. Exemplary disclosure concerns aluminosilicate zeolites in extremely finely divided form prepared by detonation of crystalline zeolites having adsorbed therein explosive compounds and compositions. In one particular embodiment, finely divided zeolite catalyst is supplied to the reactants and energy is furnished to the system by detonation of explosive-loaded crystalline zeolites within the reaction mixture. In addition, the products of detonation may afford reactants.

3,715,984

PYROTECHNIC DEVICES

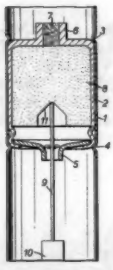
Dudley Charles Murray, Homington, England, assignor to Pains-Wessex Limited, Salisbury, Wiltshire, England

Filed June 9, 1970, Ser. No. 44,725

Claims priority, application Great Britain, June 9, 1969, 28,974/69

Int. Cl. C06d *1/04*; C06b *19/02*

U.S. Cl. 102—34.2 13 Claims



In a rocket with plastic propellant, which includes a solid oxidizing agent, a fuse means is used to directly ignite the propellant, and copper chromate is associated with the propellant by either being distributed within the propellant and/or on the surface of the propellant to be ignited.

3,715,985

IMPACT SWITCH

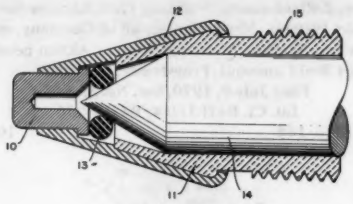
Mark A. Fugelso, 521 12th Ave. S.E., Minneapolis, Minn.

Filed June 9, 1970, Ser. No. 44,830

Int. Cl. H01h *35/14*; F42c *19/06*, *15/40*

U.S. Cl. 102—70.2 R 2 Claims

A nose impact switch for a projectile comprising a plunger, an insulator, a cover and a O-ring assembled such that when a projectile impacts, the plunger is moved back against a slender



rod, constituting a switch function and thereby conducting electrical energy through the plunger to the rod and to a receptor.

3,715,986

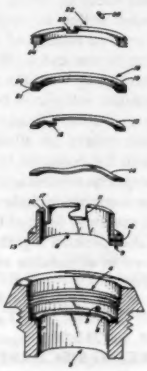
TORQUE CLUTCH FOR MILITARY FUZES

Scott B. Dunlap, Peter R. Osterling, and Charles W. Tepper, Rochester, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1970, Ser. No. 10,109

Int. Cl. F42c *9/00*

U.S. Cl. 102—71 10 Claims



A torque clutch for time settable fuzes in which assembly friction is generated at two interfaces between asbestos fiber pads and a smooth metal surface. Axial pressure at these interfaces is provided by a spring washer and is adjusted by a threaded ring. The threaded adjusting ring is pinned to the nonrotating fuze member and the lower asbestos friction pad is bonded to the nonrotating fuze member to assure that these three parts do not move with respect to each other.

3,715,987

FUZE FOR A NONGYRATORY PROJECTILE

René Morel and Robert Simmen, Geneva, Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed Apr. 21, 1971, Ser. No. 136,065

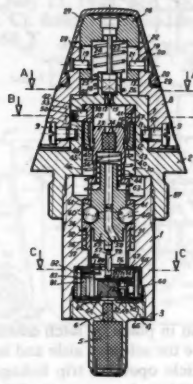
Claims priority, application Switzerland, May 14, 1970, 7,240/70

Int. Cl. F42c *1/08*

U.S. Cl. 102—74 10 Claims

The fuze, e.g. for a mortar, can be detonated instantaneously on impact or, by previous adjustment, with a time delay. The fuze has a primary fuse for detonation on impact by a firing pin but is held spaced from the

latter by a locking device which can be unlocked by the axial acceleration due to departure of the shot. The fuze also has a detonator safety device comprising a secondary fuse and a holder movable transversally to the axis of the fuze to bring the secondary fuse opposite the detonator. Time delay of the secondary fuse is provided by a clockwork movement rotating a toothed sector. A second firing pin for the secondary fuse acts as a stop blocking the



toothed sector in inactive position. The second firing pin is borne by a plunger slidable axially in the fuze. A ball blocking mechanism fixes the primary fuse holder and the plunger rigidly to one another as long as the projectile has not undergone impact after the departure of the shot. Impact releases the blocking balls enabling the plunger and thus the second firing pin to be driven back by a spring, with the time delay, against the secondary fuse.

3,715,988

MISSILE FUSES

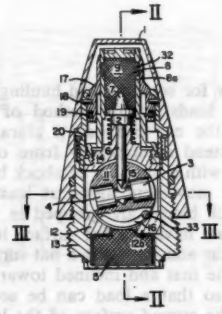
Roger Bares, Roques S/ Garonne, France, assignor to Societe E. Lacroix

Filed July 29, 1970, Ser. No. 59,126

Claims priority, application France, Aug. 26, 1969, 6929160

Int. Cl. F42c *15/26*

U.S. Cl. 102—80 **5 Claims**



A fuse for a ballistic missile comprising a hammer and a firing chain so arranged that when the missile strikes its objective the hammer penetrates the firing chain and causes the missile to explode. The firing chain includes two detonators carried in a rotor which has a safety position in which the detonators are out of alignment with the firing hammer, the detonators being brought into active position with a delay period after firing of the missile due to an imbalance in the rotor so that rotation of the missile after firing causes the detonators to be aligned with the hammer. In consequence when the missile strikes an objective after a predetermined time from the initiation of its flight the hammer penetrates the detonators and causes the missile to explode.

3,715,989

IMPACT FUZE FOR PROJECTILES

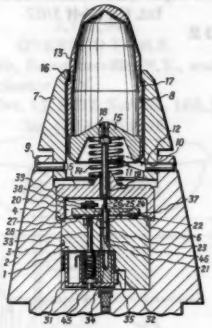
Robert Apotheloz, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Buhrle AG, Zurich, Switzerland

Filed April 26, 1971, Ser. No. 137,213

Claims priority, application Switzerland, May 1, 1970, 6593/70

Int. Cl. F42c *9/04*

U.S. Cl. 102—84 **2 Claims**



An impact fuze for projectiles of the type containing a controllably adjustable escapement regulator for determining the post-bore safety period, i.e. the safe period of the fuze after leaving the barrel. Means are provided for adjusting the running time of the escapement by altering the depth of engagement between the escapement wheel and the escapement lever. These means may comprise a bearing pin having portions of different diameters which is displaceable so that the different diameters can be selectively engaged by the bearing bore of the escape lever to vary the depth of the engagement. The bearing pin may form the striker pin of the fuze. Thus it is possible for the post-bore safety period of the projectile to be adjusted by a gun crew before the firing of the gun to defend gun positions against a surprise attack launched from nearby.

3,715,990

LIQUID OR POWDER DISPENSING DART

Harold C. Palmer, Douglasville, Ga., assignor to Palmer Chemical and Equipment Company, Inc., Douglasville, Ga.

Filed May 21, 1971, Ser. No. 145,612

Int. Cl. F42b *5/12*

U.S. Cl. 102—92 **16 Claims**

A dart projectile with a cylinder mechanism for carrying and discharging a flowable material on impact having a hollow cylinder wall threadedly fitted with a front nose

plug and a rear stabilizer tailpiece. Within the cylinder is at least one plunger piston enclosing an explosive charge. At least one fluid directing piston covers material discharge ports in the cylinder wall, and has an inner cuspidal curved surface with a removable plug inserted longitudinally therethrough for loading flowable material

into the projectile. Impact fires the explosive charge, thereby moving the plunger piston and exerting pressure on the flowable material, causing the fluid directing piston to be moved clear of the material discharge ports so that the cuspidal surface on said piston may direct the flow of material through the material discharge ports.

3,715,991

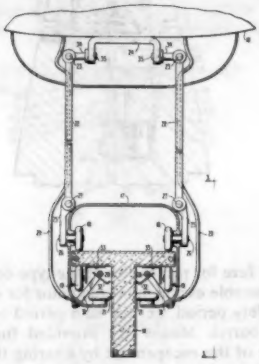
MONORAIL GUIDED ELECTRIC AIRPLANE

Thomas H. Boyd, 113 Larch Ave., Hagerstown, Md.

Filed Sept. 4, 1970, Ser. No. 69,726

Int. Cl. B64f *3/02*

U.S. Cl. 104—23 R **4 Claims**



A transportation system combining the use of both a monorail and an airborne vehicle powered by electric motors from an electric power source located along the monorail. Rigid universally movable struts interconnect the vehicle with the monorail with electric cables housed by the struts for supplying electric current from a power source to the motors. Landing-loading platforms are located along designated locations at which the vehicle may be landed for the pick-up and discharge of passengers.

3,715,992

MATERIAL HANDLING SYSTEM TRANSFER ASSEMBLY

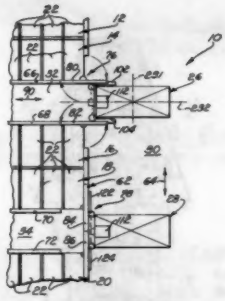
Richard J. Park, Bountiful, Utah, assignor to Kenway Engineering, Inc., Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,422

Int. Cl. B61b *15/00*

U.S. Cl. 104—88 **8 Claims**

An improved material handling system includes a main track for guiding movement of a vehicle to and from aisles between adjacent rows of bins. The vehicle is transferred from the main track to tracks in a selected aisle by operating transfer arms on the vehicle to pivot transfer rails forming lengths of the main track into alignment with the aisle tracks. Once the vehicle has entered the selected aisle and moved beyond the transfer rails, biasing springs pivot the transfer rails back into alignment with the main track where the



transfer rails are held in place by latch assemblies. When the vehicle starts to leave the selected aisle and is approaching the main track, the vehicle operates trip linkages to release the latch assemblies. Continued movement of the vehicle toward the main aisle operates other linkages to pivot the transfer rails back into alignment with the aisle tracks against the influence of the biasing springs.

3,715,993

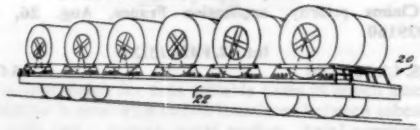
CABLE REEL CAR

Richard D. Orlik, Jenison, Mich., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio, and The Baltimore and Ohio Railroad Company, Baltimore, Md.

Filed Mar. 8, 1971, Ser. No. 121,960

Int. Cl. B60p *7/08*; B61d *45/00*

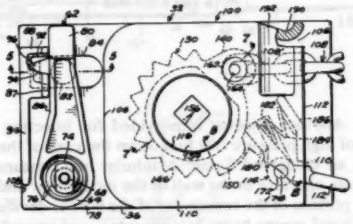
U.S. Cl. 105—36.7 **9 Claims**



A railroad car for securing and hauling roughly cylindrically shaped loads and a method of securing such loads whereby the car bed has a plurality of sunken tracks which extend substantially from one end of the car to the other with a plurality of chock blocks mounted on the bed for movement along at least some of the tracks. The chock blocks are grouped in pairs with one block in each pair having a flat surface inclined toward one end of the car and the other a flat surface facing the flat surface of the first and inclined toward the opposite end of the car so that a load can be secured between each pair with the curved surface of the load contacting the flat surfaces of the two blocks. A number of chain anchors are also preferably mounted movably in each of the two outer sunken tracks for attachment to a chain with the portion of the chain between the points of attachment to the anchors passing through and securing

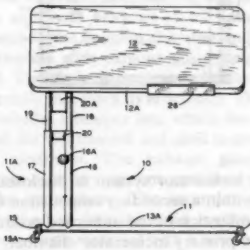
the load. A plurality of adjustable lateral support members are also mounted removably on each of the flat surfaces of each block for engaging and securing the ends of the loads.

3,715,994
LOW CLEARANCE VEHICLE TIEDOWN WINDLASS MECHANISM
Walter F. Mietla, Dearborn, Mich., assignor to Portec, Inc., Chicago, Ill.
Filed July 13, 1970, Ser. No. 54,184
Int. Cl. B60p *7/08*; B61d *45/00*
U.S. Cl. 105—368 T **17 Claims**



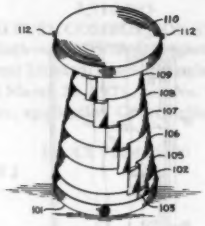
A low silhouette vehicle tiedown windlass device having a frame plate which slidably grips the cross flange of a T-beam of a cargo carrier for movement only along the beam. A locking dog is mounted for limited pivotal movement adjacent the plate and is spring biased against the plate to insert a locking pin of the dog into registering holes in the plate and T-beam to lock the tiedown against movement along the T-beam. The device has a low silhouette pawl and ratchet windlass mechanism including a drum rotatably captured in the frame and connected to one end of a tiedown chain, the drum being rotatable about an axis perpendicular to the plate for taking up and paying out the tiedown chain.

3,715,995
OVERBED TABLE
Morton I. Thomas, 125 South Street, Passaic, N.J.
Filed April 1, 1971, Ser. No. 130,097
Int. Cl. A47c *15/01*
U.S. Cl. 108—10 **6 Claims**



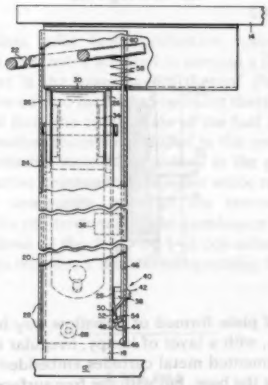
An overbed table having an upright leg portion of a construction which is highly effective to stabilize the table in use and includes a rigidified tubular structure; together with a tubular table mounting structure which facilitates the utilization of the table top in both its horizontal and tilted positions.

3,715,996
COLLAPSIBLE SUPPORT MEMBER
Rudolph L. Rolfshus, 1522 Circle Drive, Burnsville, Minn.
Filed Aug. 6, 1971, Ser. No. 169,722
Int. Cl. A47b *9/00*
U.S. Cl. 108—144 **11 Claims**



An apparatus is described which is collapsible and can be compactly reduced in size in its collapsed state, and which can be extended by means of telescoping sections to provide a supporting member for seats, tables, and other load-carrying objects.

3,715,997
OVERBED TABLE
David Edward Barth, Bowmansville, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed Oct. 12, 1971, Ser. No. 188,390
Int. Cl. A47b *9/08*
U.S. Cl. 108—146 **9 Claims**

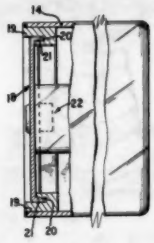


Disclosed is an overbed table, having a one-way lock mechanism including a cam member which moves a cylindrical element into a locking position during downward movement of the table top, and which permits movement of the cylinder out of the locking position upon upward movement of the table top.

3,715,998
WALL SAFE
Walter Teleky, 6050 Blvd. East, West New York, N.J.
Filed June 18, 1971, Ser. No. 154,362
Int. Cl. E06b *5/10*
U.S. Cl. 109—58 **3 Claims**

A wall safe is provided having an improved cooperation of the structural configurations of the door and of the walls of the

opening which is closed by the door whereby the safe is made highly resistant to attempted entry by forcing the door. The door is substantially rectangular and when it is in closed position the margins of the door substantially throughout their entire length are overlapped by recesses along the margins of the opening that is closed by the door. This is accomplished by a door which slides laterally so that it may be slid into locked



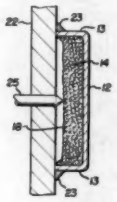
position with opposite margins inserted in recesses in combination with flanges along the other two margins of the door which extend normally with respect to the face of the door and penetrate into recesses in the safe opening while at the same time permitting lateral movement of the door. With this construction it is essentially impossible for a tool to get a grip behind the door in an attempt to pry it open.

3,715,999

DRILL PROOF PLATES

Benjamin H. Shwayder, Franklin, Mich., assignor to Shwayder Chemical & Metallurgy Corporation, Detroit, Mich.

Filed May 18, 1971, Ser. No. 144,429
Int. Cl. E05g *1/02*
U.S. Cl. 109—82 **4 Claims**



A drill proof plate formed of a shallow tray having a base and edge walls, with a layer of lumpy, irregular shaped particles of hard cemented metal carbides embedded in a brazing metal, covering the base, but with the free surface of the layer being spaced inwardly of the tray from the plane of the free edges of the wall, with the free surface being irregular and lumpy. The tray is applied against a metal support plate so that the layer free surface is spaced from the surface of the support plate, wherein the tips of drills applied through the support plate against the layer free surface are broken by the layer to prevent penetration thereof.

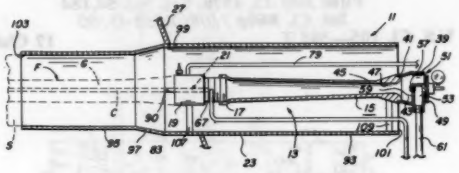
3,716,000

BURNER DEVICE

James D. Holden, Memphis, Tenn., assignor to Rees-Memphis, Inc., Memphis, Tenn.

Filed Sept. 18, 1970, Ser. No. 73,366
Int. Cl. F23b *1/28*; F23d *11/02*
U.S. Cl. 110—7 A **4 Claims**

A burner device used in conjunction with an incinerator for igniting the waste material therein, particularly during the start-up period. The burner device includes a venturi injector means for mixing gas and air and projecting the gas-air mixture in a stream through the forward end of the injector means. A flame retention nozzle is provided on the forward end of the venturi injector means for maintaining the gas-air mixture in an ignited condition and directing the flame forwardly. Another injector is provided for injecting a jetlike stream of high pressure raw fuel down the core of the flame to provide an elongated flame. A tubular hood means extends through an aperture in the wall of the incinerator and receives a major portion of the remainder of the burner device with the tubular hood means being in concentric and spaced relationship therewith.

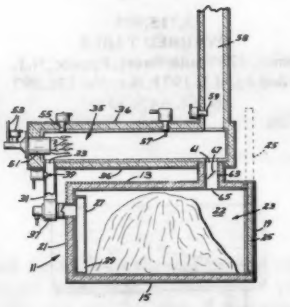


3,716,001

RECIRCULATING INCINERATOR

Chester J. Potasek, Fridley, and Frank Hiscocks, Minneapolis, both of Minn., assignors to Minneapolis Gas Company, Minneapolis, Minn.

Filed Feb. 9, 1972, Ser. No. 224,674
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 A **7 Claims**



A recirculating incinerator system is disclosed wherein a burner is housed within a secondary combustion chamber for completing the combustion of the unburned products of combustion leaving the primary incinerator chamber, and for the supplying of the heat and oxygen for the burning of the refuse in the primary incinerator chamber. Within the system, a conduit containing a fan connects the incinerator chamber with the secondary chamber at a position near the burner in the secondary chamber. A second conduit is located near the opposite end of the elongated secondary chamber and it connects the secondary chamber with the incinerator chamber. A damper is located within the second conduit. Also located

near the end of the secondary chamber is a stack for expelling the products of combustion to the atmosphere. By either manually or automatically controlling the fan and the damper, the circulating of hot gases containing oxygen from the secondary chamber into the incinerator chamber can be controlled in order to control the rate of burning of the refuse within the incinerator chamber.

3,716,002

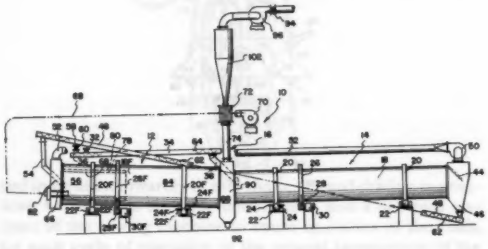
SOLID WASTE DISPOSAL METHOD AND APPARATUS

Stuart M. Porter, Denver; Ervin C. Weimer, and Harold W. Shideler, both of Wheatridge, all of Colo., assignors to Stearns-Roger Corporation, Glendale, Colo.

Filed April 1, 1971, Ser. No. 130,224

Int. Cl. F23g *5/06*

U.S. Cl. 110—14 **18 Claims**



This invention relates to a solid waste disposal apparatus that includes a rotary furnace arranged upstream of a rotary dryer in end-to-end relation to the latter but separated therefrom by a burning chamber and stationary ash removal subassembly interposed therebetween. The raw feed is mixed with a portion of the dried feed from the discharge end of the dryer and introduced into the intake end of the dryer as a moist mixture containing between approximately 40–60 percent water. The remaining dried material is introduced into the furnace. A forced draft burner at the entrance to the furnace is canted in the direction of furnace rotation so as to direct the hot products of combustion spirally along the wall thereof in concurrent flow relation to the moist mixture. Combustion takes place within the upstream end of the furnace inside a separate hollow combustion chamber that cooperates with the furnace wall to define an annulus into which the dryer gas is recycled and mixed with the products of combustion as they leave the aforesaid combustion chamber to reduce the temperature and axial velocity of the latter preparatory to delivering same to the burning chamber and ash removal subassembly complete with exhaust gas system, and dryer inlet therebeyond. The dryer is intricately baffled with a short fall fill that materially increases its efficiency. The ash removal subassembly includes a hopper into which the ashes fall and are sucked out of the top thereof and used to preheat the primary combustion airstream. The exhaust gases are exhausted through a heat recovery system and then scrubbed prior to release to the atmosphere. The invention also encompasses the novel method of treating solid wastes which comprises mixing the raw waste material with a previously dried portion thereof to make up a mixture having between approximately 40 and 60 percent moisture preparatory to drying same, drying the mixture thus produced with a heated gas mixture formed by combining within a mixing and cooling zone in the furnace the gaseous discharge from the dryer with the gaseous products of combustion generated in a combustion zone immediately upstream thereof, separating the solid products of combustion from the heated gas mixture prior to delivering a portion of the latter to the dryer, drawing off a portion of said heated gas mixture and treating it to remove entrained solids and odors prior to exhausting same to the atmosphere.

3,716,003

SOLID FUEL COMBUSTION SYSTEMS

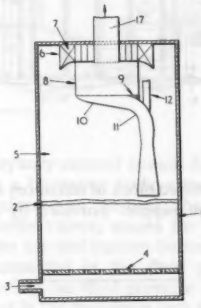
Whalley Vowe Battcock, Bletchley, England, assignor to Coal Industry (Patent) Limited, London, England

Filed March 29, 1971, Ser. No. 128,933

Claims priority, application Great Britain, April 24, 1970, 19,873/70

Int. Cl. F23d *19/00*

U.S. Cl. 110—28 J **10 Claims**



A particulate solid fuel combustion system includes a fluidized bed combustor adapted to contain a fluidized bed of inert particles in the lower region thereof. Particulate solid fuel is introduced into the bed to be burnt therein and exhaust gases derived from the combustion of the fuel are passed to a vortex combustion chamber included in the system. Fine particles of combustile material entrained in the gases are burnt within the vortex combustion chamber while relatively larger particles of combustile material are removed from the chamber to be reintroduced to the combustor at or adjacent the surface level of the fluidized bed contained therein. The invention also includes a method of operating the combustion system.

3,716,004

REFRACTORY DAMPER FOR HIGH TEMPERATURE OR CORROSIVE GASES

Allen Jacob Jones, Fall Creek, Oreg., assignor to The Community Bank, Lake Oswego, Oreg.

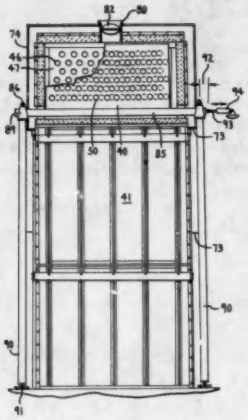
Division of Ser. No. 108,527, Jan. 21, 1971, Pat. No. 3,675,600, which is a continuation-in-part of Ser. Nos. 25,974, April 6, 1970, Pat. No. 3,598,067, and Ser. No. 56,447, July 20, 1970, and Ser. No. 87,806, Nov. 9, 1970, Pat. No. 3,665,894. This application March 27, 1972, Ser. No. 238,283

Int. Cl. F23l *13/06*

U.S. Cl. 110—163 **3 Claims**

A recirculating dryer system is disclosed wherein combustion gases from a waste wood-fired furnace are circulated through a wood veneer dryer or lumber dry kiln and returned to a mixing chamber for exposure to the hot gases leaving the furnace, causing incineration of volatile hydrocarbons and wood fiber picked up by the gas stream in its passage over the veneer or lumber. A novel form of damper construction is em-

ployed to provide a damper in elevated position between the fuel cell of the furnace and said mixing chamber. The damper



comprises an apertured block of refractory material having an inverted pendulum support provided by a pair of pivotal columns.

3,716,005

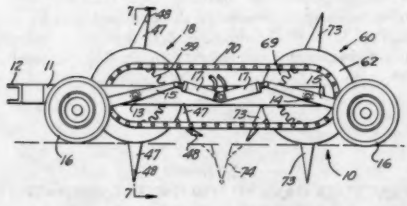
SUBSOIL AERATOR FOR DEPOSITING AND DETONATING EXPLOSIVE PELLETS

Joseph W. Fennell, R. F. D., Philipp, Miss.

Filed Oct. 1, 1971, Ser. No. 185,565

Int. Cl. A01b *45/02*; A01c *5/00*

U.S. Cl. 111—1 **7 Claims**



A subsoil aerator including a plurality of subsoil penetrating teeth mounted on a ground-engaging roller and arranged to penetrate the subsoil as the roller progresses across the ground. The teeth are hollow and are pivoted on the roller, so that as they swing out of a radial position with respect to the roller, the bottom of the tooth is opened to drop an explosive pellet into the hole made by the tooth. A magazine for the explosive pellets is positioned within the roller and dispenses a single explosive pellet to each tooth as it penetrates the ground. A following roller, also carrying pivoted teeth, is coupled to the first roller so that the teeth of the second roller penetrate the same hole made by the teeth of the first roller. The teeth of the second roller, on penetrating the same hole, comes in contact with the explosive pellet in the hole and causes the pellet to explode. Elevatable ground-engaging wheels are provided for moving the aerator from place to place.

3,716,006

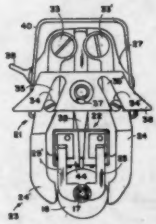
ATTACHMENT FOR THE BUTTON CLAMP OF BUTTON SEWING MACHINES, FOR HOLDING A SHANK TUBE TO BE SEWN ON TOGETHER WITH THE BUTTON

Benjamin L. Snyder, Hillside, N.J., assignor to Pentapco, Inc., Elizabeth, N.J.

Filed Jan. 18, 1971, Ser. No. 106,986

Int. Cl. D05b *3/00*

U.S. Cl. 112—114 **7 Claims**



So that the stitches securing a button shall form a shank protected in a shank tube to be sewn on with the button, an attachment which is an auxiliary clamp to hold the tubular element, is provided for mounting onto the button clamp of the button sewing machine; such auxiliary clamp having adjustment means to orient it to the button clamp.

3,716,007

AUTOMATIC STITCH-CUTTING MECHANISM FOR BAG-CLOSING SEWING MACHINES

Harold Fischbein; Irving George Fischbein, and Sam Shark, all of Minneapolis, Minn., assignors to Dave Fischbein Company, Minneapolis, Minn.

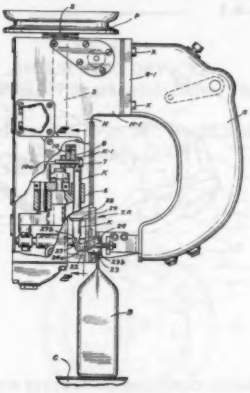
Continuation-in-part of Ser. No. 55,195, July 15, 1970, abandoned. This application March 31, 1972, Ser. No. 240,030

Int. Cl. D05b *13/00*

U.S. Cl. 112—11 **3 Claims**

A mechanism for automatically and successively cutting the thread chain in a bag-closing sewing machine after the upper edges of each bag are stitched together which essentially employs: (a) a novel and special throat plate cooperating with the presser foot of the sewing machine for receiving and guiding the upper edges of filled bags as they are moved through the machine by carrier means, and for accommodating and assuring the cooperation of the needle mechanism and looper mechanism to stitch horizontally the upper edges in said guiding action; (b) at the bag delivery end of the throat plate an outwardly protruding bag-edge guiding ramp is provided, extending horizontally and spaced outwardly from the main body of the throat plate and joined with the body in an inclined, outwardly projected juncture and thereafter extending for a short distance in substantially planar form to an abrupt outer end; (c) a thread chain receiving slot extending longitudinally therein through said ramp and open at the bag delivery end of said ramp whereby stitching produced by the machine immediately following the trailing end of each

stitched bag is automatically engaged in said slot and moved outwardly a slight distance with the trailing bag; (d) a thread chain cutting mechanism mounted inwardly of the ramp or at least its outer portion and comprising a movable sharp edge blade operating in a general plane perpendicularly of said slot



and in position inwardly of said ramp; (e) and driving connections between the shiftable cutter blade and a powered element of the sewing machine to cause operation of the blade for each cycle of operation of the general components of the sewing machine.

3,716,008

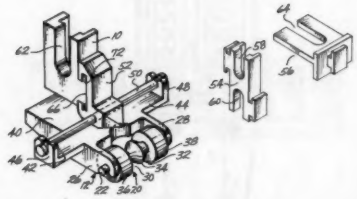
PRESSER FOOT WITH SIDEWAYS ADJUSTMENT

Robert B. Howell, 3132 Rocky Point Road, Bremerton, Wash.

Division of Ser. No. 869,836, Oct. 27, 1969, Pat. No. 3,618,547, which is a continuation-in-part of Ser. Nos. 764,453, Oct. 2, 1968, Pat. No. 3,511,201, and Ser. No. 764,518, Oct. 2, 1968, Pat. No. 3,511,200, each is a continuation-in-part of Ser. No. 501,066, Oct. 22, 1965, Pat. No. 3,349,736, which is a continuation-in-part of Ser. No. 475,486, July 28, 1965, Pat. No. 3,342,151. This application March 17, 1971, Ser. No. 125,125

Int. Cl. D05b *29/12*

U.S. Cl. 112—240 **10 Claims**



An elongated cylindrical rod is supported on an upper portion of a presser foot component. The rod extends through a transverse bore in a connector block. The connector block includes one component of a joint between it and a mounting shank. The mounting shank is adapted for connection to the presser bar of a sewing machine.

3,716,009

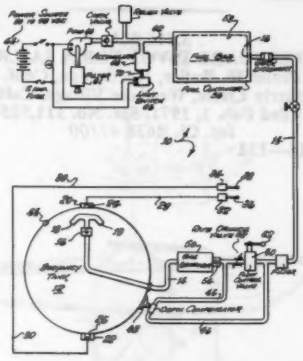
VARIABLE BUOYANCY CONTROL SYSTEM

Alvah T. Strickland, Kailua, Hawaii, assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1971, Ser. No. 201,903

Int. Cl. B63g *8/22*

U.S. Cl. 114—16 E **8 Claims**



A variable buoyancy control system for an underwater vehicle including a buoyancy tank; a main fluid pressure line which is connected to the tank; the tank having top and bottom butterfly valves; means for selectively opening and closing the top and bottom butterfly valves; a flow control valve connected in the fluid pressure line for selectively controlling the fluid pressure to the tank; a relief valve mounted in the buoyancy tank for relieving pressure from the tank upon the occurrence of positive pressure differential of the tank over ambient; a secondary fluid pressure line connected to the main fluid pressure line across said flow control valve; and a depth compensator valve connected in the secondary fluid pressure line and pressure responsive to the buoyancy tank and ambient water for by-passing fluid to the buoyancy tank upon the occurrence of a negative pressure differential between the tank and ambient.

3,716,010

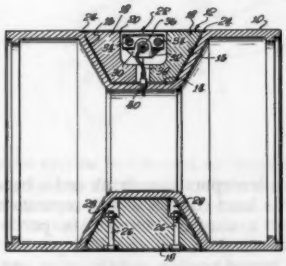
SNAP ACTING BALLAST RELEASE DEVICE

William G. Wilson, Livermore, James H. Green, Sierra Madre, and William D. White, Pasadena, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1970, Ser. No. 82,661

Int. Cl. F42b *15/10, 19/00*

U.S. Cl. 114—22 **3 Claims**



A snap acting ballast release device for a water vehicle, such as a torpedo, including: the hull of the torpedo

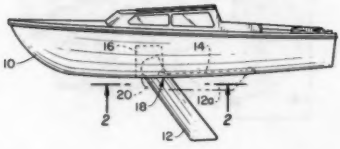
having an annular recess; a plurality of weights disposed within the recess; a resilient band extending around the weights and secured thereto in a closed biased position; means releasably connecting the ends of the band in the closed biased position; the band being adapted, because of its resiliency, to assume a relaxed open position away from the torpedo hull, so that upon release of the ends of the band the band and its attached weights snap free of the torpedo.

3,716,011

CENTERBOARD PIVOT FOR A SAILBOAT

Frank W. Butler, Northridge, Calif.
(3807 Weatherly Circle, Westlake Village, Calif. 91324)

Filed Feb. 1, 1971, Ser. No. 111,525
Int. Cl. B63b *41/00*
U.S. Cl. 114—132 **5 Claims**



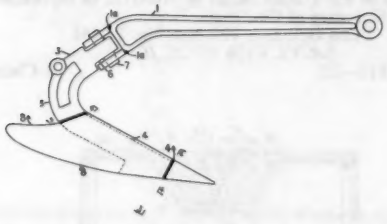
Herein described is a pivot for lowering and raising the centerboard of a sailboat. Pivot holder molds are formed into the bottom of the boat and secured thereto by a pair of nuts which are within the molds. A pair of pivot holders including the pivot rod and the centerboard of the sailboat is bolted to the nuts within the bottom of the boat.

3,716,012

ANCHORS FOR MARINE USE

Kenneth L. Wright, Coatbridge, Scotland, assignor to The Security Patent Anchor Company Limited, Whifflet, Coatbridge, Scotland

Filed June 8, 1970, Ser. No. 44,021
Claims priority, application Great Britain, June 20, 1969, 31,310/69
Int. Cl. B63b *21/34*
U.S. Cl. 114—207 **9 Claims**



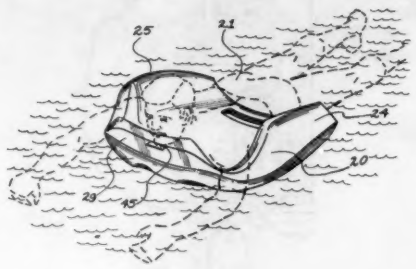
The anchor incorporates a shank and a head pivoted to the shank. The head consists of two separate end portions connected by a curved intermediate portion which is pivoted to the shank at one end. The portion of the head between the curved portion and the other end carries two sidewardly extending flukes. The flukes are formed of a plate bent about an axis of symmetry and fitted to the head portion.

3,716,013

BUOYANT POWERED SWIMMING DEVICE

Anastasios J. Vasilatos, Wilmette, Ill., assignor to A. V./American Ventures, Inc., Village of Wilmette, Ill.

Continuation-in-part of Ser. No. 765,360, Oct. 7, 1968, Pat. No. 3,543,712. This application Nov. 23, 1970, Ser. No. 92,059
Int. Cl. B63b *21/56*
U.S. Cl. 115—6.1 **11 Claims**



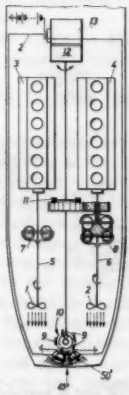
A buoyant device contoured on its upper surface to support the body of the user while permitting freedom of motion of the arms and legs. The lower side of the device is hydrodynamically streamlined taking into account the location of one or more propulsion devices located beneath the lower surfaces. Energy storage and control means are provided interior of the device and specially contoured propeller shrouds enhance efficiency.

3,716,014

SHIP PROPULSION SYSTEM HAVING SEPARATE PROPULSION UNITS FOR CRUISE AND LOW SPEEDS

Rudolf Laucks; Werner Fork, both of Heidenheim (Brenz), and Harald Gross, Sohnstetten, all of Germany, assignors to Firma J. M. Voith GmbH, Heidenheim, Germany

Filed Aug. 14, 1970, Ser. No. 63,864
Claims priority, application Germany, Aug. 16, 1969, P 19 41 652.5
Int. Cl. B63h *1/10*
U.S. Cl. 115—35 **21 Claims**



A ship is provided with a propulsion unit for cruising speed and a cycloidal propeller as a second propulsion unit used for

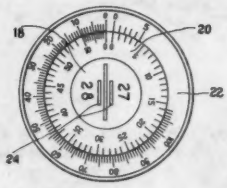
slow speeds. The cycloidal propeller has a propeller housing and a propeller runner with the propeller blades being equidistantly spaced on a blade orbit and pivotally mounted so that the blades may be pivoted in directions parallel to the direction of travel of the ship. The cylinder propeller may be used as a non-rotating passive rudder when the ship is cruising and may also be used for steering. Structures are disclosed for pivoting of the blades into various positions.

3,716,015

MEASURING DEVICES

Peter James Godfrey, 27 Brackendale Drive, Thackley, Bradford, England

Filed Nov. 12, 1970, Ser. No. 88,536
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **9 Claims**



A measuring device adapted to indicate a measurement value in two different scales, e.g. a metric length scale and a British length scale, said device comprising two elements relatively movable, each of which carries a scale and a datum mark for the scale of the other element, in order to indicate therein a measurement value corresponding to a relative shifting motion of said elements, said scales extending in opposite directions to each other at the adjacent surfaces of said elements.

3,716,016

GOLF SCORE MARKER

Perry J. Aylesworth, 2721 Dominion Road, and Arthur J. Lesperance, 2720 Dominion Road, both of Windsor, Ontario, Canada

Filed Feb. 16, 1971, Ser. No. 115,218
Int. Cl. A63b *71/06*
U.S. Cl. 116—120 **1 Claim**

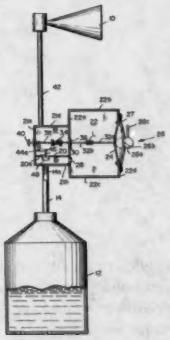
This invention consists of a strip of flexible material to the face of which are attached a number of circular segment pockets which are numbered consecutively starting with number one at the first of said pockets. A golf tee which is inserted into the pockets, is moved from one pocket to the next, thus denoting the number of strokes taken by the golfer to drive the ball from each tee to the cup. The numbering being consecutive, each pocket stands for one stroke.

3,716,017

ACTUATING AND CONTROL SYSTEM FOR GAS-OPERATED FOG HORN

Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corp., White Plains, N.Y.

Filed March 10, 1971, Ser. No. 122,770
Int. Cl. G10k *5/00*
U.S. Cl. 116—137 **13 Claims**



An actuating and control system for a gas blown fog horn including a source of liquified gas. The liquified gas is in continuous communication with an inlet plenum. An outlet plenum is provided which is in continuous communication with the fog horn. Operator control means controls communication between the inlet plenum and outlet plenum and when actuated places said plenums in communication so that the horn is blown. Additionally, an automatic pressure operated blow control means is provided and can be selectively operated for periodically and automatically transferring pressurized gas from the source to the fog horn.

ERRATUM

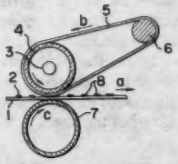
For Class 118—66 see:
Patent No. 3,716,221

3,716,018

DEVICE FOR HEATING AND FIXING TONER IMAGES UPON A RECORDING MEDIUM

Wasaburo Ohta, Yokohama, and Kazuhiko Kasuya, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1970, Ser. No. 78,486
Claims priority, application Japan, Oct. 9, 1969, 44/81371
Int. Cl. B05c *11/02*
U.S. Cl. 118—101 **8 Claims**



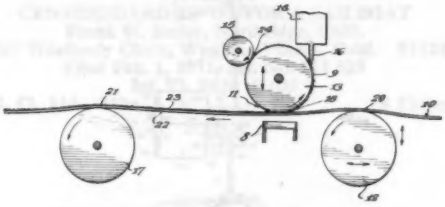
A non-adhesive endless belt is used for heating and fixing toner images upon a recording medium by mounting the belt on a roller having means for heating it and on a driving roller spaced apart from the heated roller means. The recording medium is passed closely adjacent to or with its toner-carrying surface in contact with the surface of the heated belt to fuse the toner in the form of the image on the recording medium. Cleaning means and a preheated pressure roller are also provided to improve the quality of the fused toner image.

3,716,019

ROLLER COATING SYSTEM FOR ONE SIDE STRIP COATING

William A. Carter, Gary; William C. Sievert, Chesterton, and James L. Munson, Highland, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Nov. 23, 1970, Ser. No. 91,914
Int. Cl. B05c *1/00*
U.S. Cl. 118—246 **7 Claims**



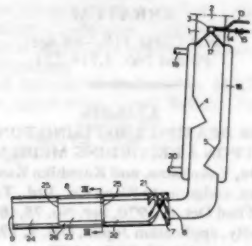
This invention relates to a new and unobvious apparatus for depositing fluids onto one side of a continuous strip and more particularly to depositing a fluid, generally of low viscosity, onto one side of a metal strip without depositing any of the fluid onto the other side of the strip.

3,716,020

APPARATUS FOR COATING GRANULES WITH A THIN DENSE LAYER

Willem De Wit, Heerlen, and Petrus F. A. M. Hendriks, Sittard, both of Netherlands, assignors to Stamicarbon N.V.

Filed Sept. 29, 1970, Ser. No. 76,439
Int. Cl. B05b *17/00*; B05c *5/00*
U.S. Cl. 118—303 **4 Claims**



A method and apparatus for applying a thin, protective coating to individual granules by generating a liquid screen of the coating material at one end of a vertical shaft, passing the granules down through the screen and onto baffles disposed in the lower portion of the shaft. The liquid will pass down the walls of the shaft and onto the baffles and become entrained with the granules impinging thereon. A rotary drum is provided adjacent the discharge end of the shaft to intimately mix the materials passing out of the shaft.

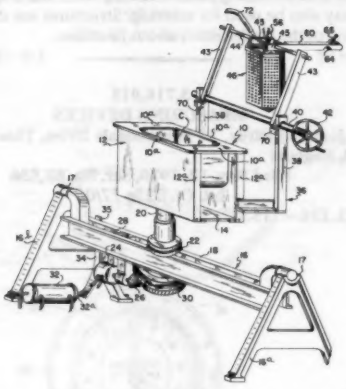
3,716,021

APPLICATOR MECHANISM FOR PARTICULATE MATERIAL

Ralph Fry, Warren, Pa., assignor to Ferro Corp., Cleveland, Ohio

Filed March 10, 1971, Ser. No. 122,802
Int. Cl. B05b *7/00*; B05c *5/00*
U.S. Cl. 118—308 **15 Claims**

Apparatus for applying powdered porcelain enamel to a heated hollow article. Apparatus includes a tiltable, rotatable base having means for holding the hollow article for application of the powder. A support means for a seive applicator is mounted on the base for moving the applicator into the hollow article.

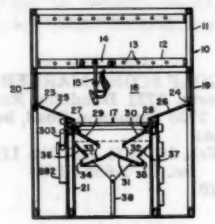


3,716,022

AUTOMATIC SPRAY-PAINTING MACHINE

Harry Szczepanski, 900 Clancy Ave. NE., Grand Rapids, Mich. 49503

Filed Oct. 8, 1970, Ser. No. 79,012
Int. Cl. B05b *1/28*
U.S. Cl. 118—326 **3 Claims**



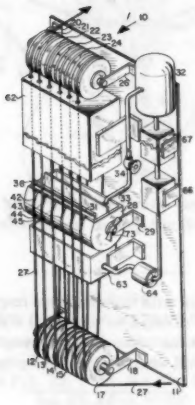
A conveyor extends into a spray station from an exterior loading station. At least one fixture for supporting a mask and work pieces is engageable with the conveyor for movement into the spray station. The conveyor preferably continues the movement on through the spray station, and out the opposite side, so that the enclosure forming the spray station can be shorter than the length of the fixture assembly in the direction of movement of the conveyor. Space under one side of the conveyor is utilized for mask-washing equipment. Lateral transfer means, together with an elevator system, moves the work support and mask from the conveyor to and through the washing station. A program controller determines the painting cycle according to easily preset adjustments, and spray gun assemblies can be lifted out and installed as a unit for each job set-up. A down-draft ventilation system in the work station accommodates the wide range of painting conditions the machine is capable of handling.

3,716,023

LATEX APPLICATOR

John S. Walukonis, Jr., and Donald D. Banks, both of Anderson, Ind., assignors to Anaconda Wire and Cable Company

Filed July 15, 1971, Ser. No. 162,903
Int. Cl. B05c *3/154*
U.S. Cl. 118—420 4 Claims



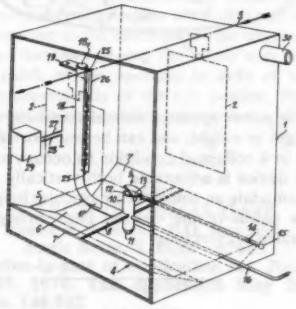
Large wires are coiled with latex by pulling them upward through curved channels down which the latex continuously flows. Flow rate is controlled by means of a weir in the tank and bubbles are broken up by flowing the latex through apertures in a submerged baffle.

3,716,024

A DEVICE FOR SPRAYING AN ELECTRIFIED POWDERED MATERIAL ONTO A STRUCTURE

Gerald Pierre Pierson, Calvados, France, assignor to Societe Carrier, societe anonyme, Suresnes, France

Filed Oct. 27, 1970, Ser. No. 84,260
Claims priority, application France, Nov. 4, 1969, 6937914
Int. Cl. B05b *5/02*; B05c *11/00*
U.S. Cl. 118—630 11 Claims



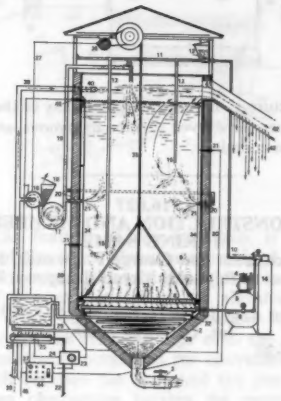
Device for spraying an electrified powdered treating or coating material onto a structure. The device comprises a cabin through which the structure is conveyed. A mixture of the powdered material and air is sprayed onto the structure by spraying means connected to metering and mixing means placed in the bottom of a bank containing the powdered material. Means are provided for recovering the powdered material which has not been deposited on the structure and returning this material to the tank.

3,716,025

VERTICAL TANK SYSTEM FOR FISH REARING

Buford Bernard Lawson, 2994 Woodvale Drive, Memphis, Tenn.

Filed Nov. 30, 1970, Ser. No. 54,832
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 7 Claims



A self-contained system for rearing and harvesting fish commercially, e.g., catfish or the like. The system includes a vertically disposed cylindrical tank having a roof positioned over the open upper end thereof. A cone-shaped bottom member of the tank collects toxic matter and decomposed food and provides s sump which is communicated with a closable dump valve. Also included are primary and secondary aeration units which jointly provide multilevel aeration from a source of air. An automatic portion feeder is included which is connected with an outside water source and has discharge structure communicated with the interior of the tank for conveying and discharging optimum portions of feed into the tank. The temperature of the water within the tank is thermostatically controlled within an optimum temperature range by structure provided and adapted for this purpose. A remote control panel is included which is electrically connected to certain disclosed structure to conveniently operate the totally self-contained system. Also included is a circular grid which is adapted to be raised to a discharge outlet that communicates with a loading chute. Raising the grid is effective to urge the fish through the discharge outlet hence the loading chute for loading the harvested fish onto a suitable conveyance.

3,716,026

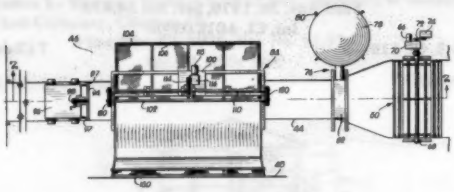
APPARATUS FOR RAISING AND HARVESTING FISH

William R. Gross, P. O. Box 510, El Dorodo, Kans.

Division of Ser. No. 34,244, May 4, 1970, Pat. No. 3,678,898.
This application July 2, 1971, Ser. No. 159,287
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 10 Claims

A method and apparatus for raising and harvesting fish utilizes a closed loop for confining a body of water and a paddle wheel to create an artificial current in the body of water of sufficient magnitude to induce fish in the water to swim against the current. Feeding mechanism disposed adjacent the paddle wheel is operable to introduce feed into the water. The artificial current created by the paddle wheel induces fish in the water to swim against the current and toward the food supply. A plurality of air-gathering buckets on the paddle wheel aerate the water to assure an adequate supply of oxygen for the fish. A portion of the closed loop defines an open ended

container which is periodically operated to confine a number of fish when the latter have gathered to partake of the food. The container has a curved surface defining its bottom and



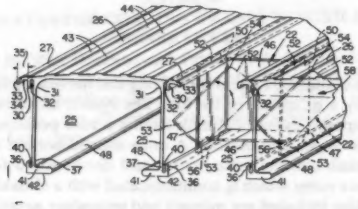
rotatable structure is disposed longitudinally of the container for rotation over the curved surface to remove any fish confined within the container.

3,716,027

FLOOR CONSTRUCTION AND MEMBER FOR MAKING SAME

Donald E. Vickstrom and George F. Swenck, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 13, 1971, Ser. No. 171,527
Int. Cl. A01k *1/00*
U.S. Cl. 119—28 **20 Claims**



An improved floor construction is provided which is particularly adapted for an animal enclosure used to raise animals in confinement and such floor construction employs a plurality of improved floor-forming channel members capable of carrying heavy loads as well as improved connector-spacers for holding such channel members together in spaced relation. Each channel member is substantially U-shaped and is comprised of spaced side walls joined together by a top load-carrying wall which has a pair of side portions arranged outwardly of the side walls. A pair of top retaining flanges extend downwardly from the side portions and each retaining flange cooperates with a top portion of an associated side wall to define a top retaining groove therebetween. The channel member may also have a pair of bottom retaining flanges arranged outwardly of the side walls with each bottom retaining flange cooperating with a bottom portion of an associated side wall to define a bottom retaining groove therebetween. Each of the grooves is adapted to receive a portion of a connector-spacer therewithin to connect each channel member in spaced relation to an associated channel member.

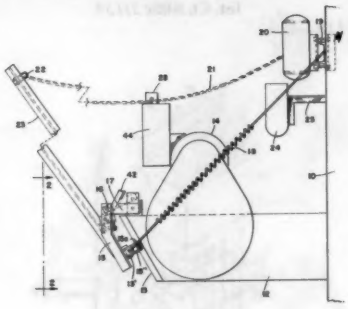
3,716,028

TIME CONTROLLED DISPENSING MECHANISM FOR FEED STORAGE CONTAINERS

Henry Baskerville, Elmington Farm, Route 2, Box 203, and Marshall Edwin Davis, Elmington Farm Route 2, Box 16F, both of Powhatan County, Va.

Filed Feb. 24, 1971, Ser. No. 118,443
Int. Cl. A01k *05/02*
U.S. Cl. 119—51.11 **8 Claims**

A feed storage container such as a silo is provided at its bottom with an unloader chute having a normally closed door. A time controlled dispensing mechanism includes a reversible electric motor which is operatively connected to the door for opening and closing the same at timed intervals. The reversible motor is in circuit with switch means responsive to opening and closing of the door. The electrical circuit also includes other switch means for actuating a conveyor in the unloader chute and a roller mill when the door is open.

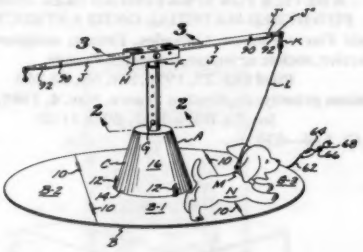


3,716,029

ANIMAL EXERCISING DEVICE

Charles H. Pillsbury, Jr., 2253 Stonyvale Road, Tujunga, Calif.

Filed Jan. 22, 1971, Ser. No. 108,708
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 **7 Claims**



A portable power operated animal exercising device that is relatively light in weight, and can be transported to a desired destination in a collapsed condition to occupy a minimum of space. The device is adjustable both vertically and horizontally to accomodate an animal of a particular height, as well as to vary the radius of the circular path through which the animal is guided in exercising.

3,716,030

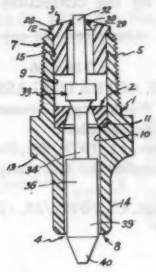
ANIMAL OPERATED WATERING DEVICE

James B. Godshalk, Yardley, and William P. Alburger, Hatfield, both of Pa., assignors to Fox Products Co., Philadelphia, Pa.

Continuation of Ser. No. 883,474, Dec. 9, 1969, abandoned. This application April 27, 1971, Ser. No. 137,987
Int. Cl. A01k *07/00*
U.S. Cl. 119—72.5 **10 Claims**

A valve assembly including a generally tubular body means having a valve means positioned therein adapted to be actu-

ated by an animal. The valve means includes a frusto-conical member engageable with a member providing a valve seat.

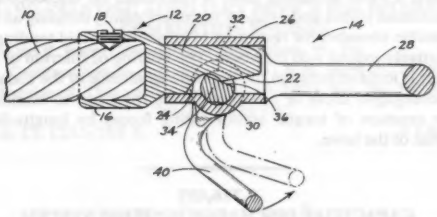


Said member includes a lip elastically yieldable under forces applied by said valve means to stop the flow of liquid through the assembly.

3,716,031
QUICK RELEASE LARIAT HONDA

Dayton J. Rowbury, Imnaha, Oreg., assignor to Dale A. Rowburg, Joseph, Oreg.

Filed Feb. 26, 1971, Ser. No. 119,245
Int. Cl. A01k *29/00*
U.S. Cl. 119—153 6 Claims



A quick-release honda for mounting on a rope in making a lariat comprises a closed eye portion dimensioned to receive the rope in running noose relation, a socket extending from the eye portion, and a ferrule mountable on the end of the rope. Two-position rotary catch means are mounted on the socket and releasably interengage the socket and ferrule. Trip means is connected to the catch means for tripping it by jerking the rope, thereby opening the noose and releasing the lariat. The catch means operates in both of its positions completely independently of the eye portion, thus ensuring the continued loose running movement of the rope therethrough.

3,716,032
SELECTIVE ANIMAL GATE

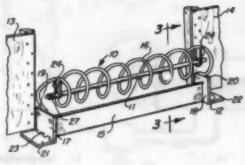
Frank R. Laurenz, P.O. Box 359, Eagle Butte, S. Dak. 57625

Continuation-in-part of application Ser. No. 50,469, June 29, 1970. This application May 26, 1971, Ser. No. 146,982
Int. Cl. A01k *29/00*
U.S. Cl. 119—155 23 Claims

An electric gate for animal pens is taught. It selectively obstructs passage of smaller animals and allows passage of larger or adult animals.

The gate comprises an electrode which is located within and is partially shielded by an elongated cage or housing over which a larger or adult animal may freely pass without suffering exposure to or contact with the electrode. The walls of the elongated cage have repetitive substantially transversely extending or annular-like open spaces aligned sequentially along the length of the cage. The width of these open spaces is sufficient to allow entry of a leg of predetermined smaller animals and consequent deterrent exposure to the interior electrode. To larger animals, the cage provides unsure footing, causing them to preferentially step over it.

The preferred cage is formed of bar-like material or a rod of metal spiralled or looped into a longitudinally extending helical coil.

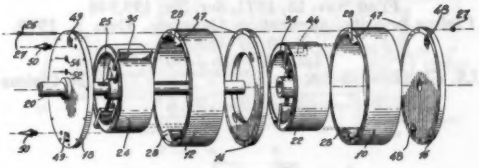


A critical feature of the invention is the elevated mounting of the cage. Means are provided for mounting it in a horizontal manner across the access opening of an animal pen and in spaced or elevated relationship above the floor surface for the access opening. Dung falling through the elevated cage onto the pen floor surface is thus readily accessible for convenient removal. A barrier wall between the cage and the pen floor surface provides an obstruction barring the escape of smaller animals underneath the elevated cage.

3,716,033
ROTARY INTERNAL COMBUSTION ENGINE

Rene Lepine, 815 Batiscan Street, Duvernay, Laval, Quebec, Canada

Filed Dec. 4, 1970, Ser. No. 95,275
Claims priority, application Canada, Jan. 26, 1970, 073126
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.41 8 Claims



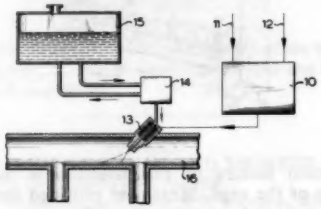
A rotary internal combustion engine comprising two aligned cylindrical housings separated by a central disc and closed by two end discs thus forming a compressor and a motor. The housings form separate stators for the compressor and the motor. A rotor is mounted coaxially within each stator and both rotors are secured to a common shaft. Each stator includes a number of inwardly extending projections and each rotor includes a number of radial blades projecting therefrom and adapted to contact the stator to form with the projections on the stator identical compression chambers in the compressor and identical combustion chambers in the motor. The blades of the rotor of the motor lead the blades of the rotor of the compressor. Conduits means are located in the central disc and cooperate with similar conduit means in the rotors for communicating the compression chambers formed between the projections and the blades of the compressor with the combustion chambers formed between the corresponding projections and the blades of the motor to transfer the medium compressed in the compression chambers of the compressor into the combustion chambers of the motor when the rotor of the compressor is at the predetermined location with respect to the stator of the compressor.

3,716,034

TEMPERATURE-DEPENDENT TIME-DELAY SWITCH

Hermann Schmid, Goeppingen, Germany, assignor to Robert Bosch, GmbH, Stuttgart, Germany

Filed Sept. 17, 1970, Ser. No. 73,040
Claims priority, application Germany, Oct. 2, 1969, P 19 49 703.1
Int. Cl. F02m 51/00
U.S. Cl. 123—32 EA 15 Claims



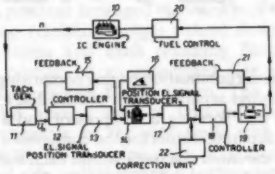
A Miller integrator is connected to the output of a circuit the output current of which is dependent on the temperature of a temperature-dependent resistor responsive to engine temperature. A switching stage which controls the current through the starting valve of the engine is turned off when the current in the Miller integrator reaches a predetermined value after a time delay that depends on the temperature of the temperature-dependent resistor.

3,716,035

FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Karl-Heinz Adler, Leonberg, Heinrich Knapp, Leonberg-Silberberg, and Konrad Eckert, Stuttgart, Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Nov. 18, 1971, Ser. No. 199,946
Claims priority, application Germany, Dec. 3, 1970, P 20 59 483.6
Int. Cl. F02b 3/00
U.S. Cl. 123—32 EA 10 Claims



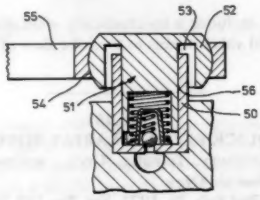
The position of a positioning member which controls the amount of fuel to be injected into an internal combustion engine is determined by deriving a signal representative of engine speed, modifying the signal to obtain an output reflecting engine characteristics, and then controlling with the modified signal the position of a cam, preferably a three-dimensional cam, the position of the cam being additionally controlled by the position of the accelerator for the engine. A signal is derived from a cam follower, and this signal is additionally affected by a correction unit correcting for changes in ambient air pressure, temperature of the engine, or ambient conditions, or the like, so that the final output controlling the setting of the positioned member which determines the amount of fuel injected will be representative of engine characteristics, the accelerator position, and ambient conditions as sensed by the correction unit.

3,716,036

VALVE ACTUATING ASSEMBLY

Hermann Kruger, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft

Filed Dec. 11, 1970, Ser. No. 97,186
Claims priority, application Germany, Dec. 13, 1969, P 19 62 631.4
Int. Cl. F01l 1/18, 1/24
U.S. Cl. 123—90.43 1 Claim



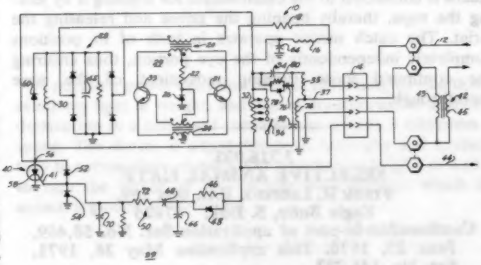
An internal combustion engine valve actuating assembly in which a valve actuating lever is fulcrumed on telescopically associated piston and cylinder members jointly defining an expansible chamber for reception of pressurized fluid tending to relatively extend said members. The bearing or fulcrum of the lever is located between the opposite axial ends of the slidably interengaged areas or interface of the members to minimize the creation of torque and/or tilting forces by longitudinal thrust of the lever.

3,716,037

CAPACITIVE DISCHARGE IGNITION SYSTEM

Christopher A. Jacobs, 1328-½ West 24th Street, Los Angeles, Calif.

Filed Oct. 15, 1969, Ser. No. 866,626
Int. Cl. F02p 1/00
U.S. Cl. 123—148 E 7 Claims



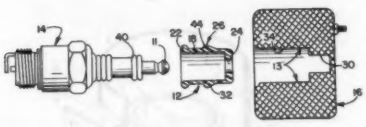
An ignition system for internal combustion engines utilizing a capacitive discharge to supply energy to the spark plugs. Charging and discharging of the capacitor is controlled by a circuit utilizing a silicon controlled rectifier which operates in response to the contact breaker for turning on and in response to positive back-biasing for turning off. The system automatically adjusts spark characteristics to accommodate changes in engine environment and running conditions.

3,716,038

HIGH VOLTAGE COIL BOOT

Louis A. Bevacqua, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed March 31, 1971, Ser. No. 129,906
Int. Cl. F02p 9/00
U.S. Cl. 123—148 A 8 Claims



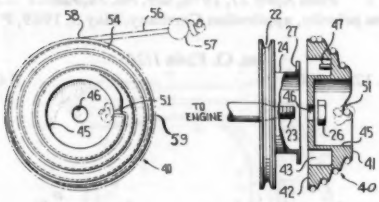
A high voltage coil boot for connecting an ignition coil and a spark plug together comprising a tubular sleeve of resilient electrical insulating material including a collar portion intermediate the ends of the sleeve and having a ramp portion with an air vent to facilitate mounting of the coil onto the boot mounted spark plug. The portion of the collar which prevents disengagement from the coil may be either sawtooth or rounded. With the ignition coil mounted over the boot, the collar is deflected to form an inner annular lip below a spark plug rib to resist disengagement thereof. Portions on each end of the tubular sleeve provide additional sealing and shock mounting.

3,716,039

HAND-STARTING AUXILIARY DEVICE FOR INTERNAL COMBUSTION ENGINES

Donald R. Perry, Manderley Place, Salem, W. Va.

Continuation-in-part of Ser. No. 31,620, April 27, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,393
Int. Cl. F02n 3/02
U.S. Cl. 123—185 A 5 Claims



An auxiliary device that is attached to the crankshaft of a hand-started internal combustion engine, comprising a beehive-shaped body having a base, adjacent to the engine, and a spiral groove therearound that terminates in a notch at the apex thereof within four full turns. The initial groove at the base comprises a double groove. Substantial inward progression of the groove toward the axis of the body approximately coincides with the initiation of firing by the engine, whereby high power input is sustained until firing commences, and rotational speed is increased thereafter.

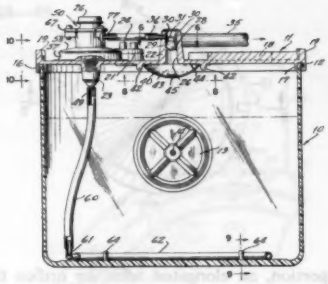
3,716,040

FUEL ADDITIVE INDUCTOR FOR INTERNAL COMBUSTION ENGINE

Ivey Herpin, 110 No. Ira Ave., Dallas, Tex.

Filed Aug. 21, 1970, Ser. No. 65,766
Int. Cl. F02b 47/02; F02m 17/22
U.S. Cl. 123—198 A 6 Claims

A device for containing a liquid fuel additive, such as a water-alcohol solution, which is vaporized and induced by vacuum into the fuel system of the internal combustion engine. The device includes a container for the liquid additive composition, having an adjustable vacuum controlled air intake valve for controlling the flow of air from a manifold within the liquid to produce the vapor carried to the engine. The air is filtered before entering the container, and a baffle device prevents the flow of liquid from the container outlet.

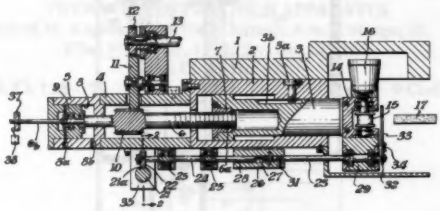


3,716,041

GRINDSTONE DRESSING TOOL PROTECTION DEVICE

Hiroshi Ota, c/o Toyoda Koki Kabushiki Kaisha of 1,1-chome, Asahimachi, Kariya, Aichi Prefecture, Japan

Filed March 31, 1971, Ser. No. 129,876
Claims priority, application Japan, April 7, 1970, 45/29686
Int. Cl. B24b 53/00
U.S. Cl. 125—11 3 Claims



Grinding machine comprises rotatably mounted grindstone and rotatable grindstone dressing device having axis of rotation parallel to axis of grindstone. Protector shield is mounted between dressing tool and grindstone for protecting dressing tool at all times except during actual dressing operation of grindstone. Motivator moves protector shield into and out of alignment with dressing tool and grindstone so that dressing tool is protected by shield when shield is positioned between tool and grindstone.

3,716,042

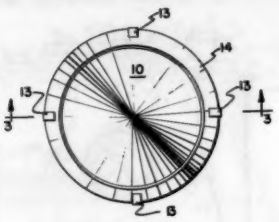
CONICAL RADIANT ORCHARD HEATER

Leslie V. Smith, 112 N. 22nd St., Yakima, Wash.

Filed Jan. 25, 1971, Ser. No. 109,320
Int. Cl. A01g 13/06
U.S. Cl. 126—59.5 1 Claim

The radiant orchard heater of this invention generally includes a housing having an inverted cone shaped canopy distally disposed above a substantially cone shaped base portion having legs carried thereby, and a burner assembly cen-

trally disposed in the invert or lowermost portion of the base portion. The burner assembly comprises a pair of opposing dish-like plates spaced apart by a plurality of upstanding legs and carried by a multiplicity of posts mounted in the invert of



the base portion, an elongated tube-like orifice threadably carried at one of its terminal ends by the lowermost dish-like plate having a plurality of air mixing ports distally disposed above the opposite terminal end of the orifice, and means connecting the orifice to a remote fuel supply under pressure.

3,716,043

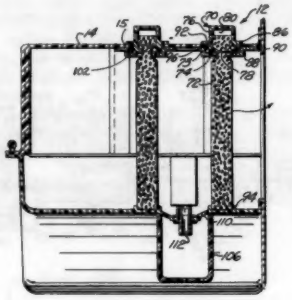
FURNACE HUMIDIFIER

Kermit E. Chilcoat, Valley City, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 858,795, Sept. 17, 1969, Pat. No. 3,612,033. This application April 19, 1971, Ser. No. 134,996

Int. Cl. F24f *3/14*

U.S. Cl. 126—113 **11 Claims**



A humidifier includes a housing in which vaporizer means for promoting vaporization of liquid is removably received. The vaporizer means includes a liquid manifold and a porous material. The liquid manifold is connected to a pump assembly by a conduit such that the manifold is supplied with a liquid thereby. The housing has an opening therein which the manifold is adapted to sealingly engage and the conduit is secured in a predetermined location with respect to that opening. The conduit and the manifold further include means for automatically sealingly engage each other in response to the manifold being inserted into sealing engagement with the opening in the housing thereby providing a fluid flow path from the conduit to the interior of said manifold. The manifold has a portion which grips the porous material such that the porosity of the material is controlled and the flow of liquid from the manifold to the porous material is regulated thereby. The manifold is configured such that the vaporizer means and manifold are removable without disassembly of the humidifier.

3,716,044

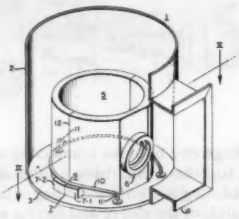
COMBUSTION CHAMBER RETAINING MEANS

Woodrow W. Brockhurst, Cleveland, Ohio, assignor to Luxaire, Inc., Elyria, Ohio

Filed Nov. 8, 1971, Ser. No. 196,666

Int. Cl. F23m *5/00*

U.S. Cl. 126—151 **4 Claims**



This invention relates to an arrangement of retention means for positioning and retaining a combustion chamber within the external wall of a heat exchanger. The combustion chamber, which may be comprised of complementary pieces, has at least one lug projecting outwardly therefrom. In addition, the combustion chamber retention means includes an open ended ring which is attached to the base of the heat exchanger and is adapted to surround the combustion chamber and overlay the chamber lugs in order to maintain the chamber in a relatively fixed position.

3,716,045

HEAT EXCHANGER

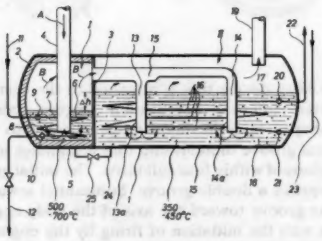
Frohmut Vollhardt, Siegen-Burbach, Germany, assignor to Siegener Aktiengesellschaft, Geisweid, Germany

Filed April 27, 1970, Ser. No. 31,928

Claims priority, application Germany, May 3, 1969, P 19 22 647.2

Int. Cl. F24h *1/20*

U.S. Cl. 126—360 A **5 Claims**

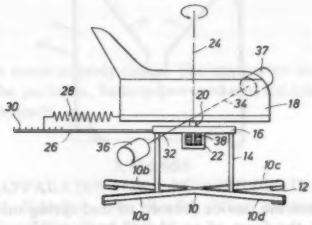


A heat exchanger for cooling hot inert gases in a metal bath while producing steam in two serially arranged chambers each containing a metal bath and heat exchanging surfaces, the arrangement being such that the gases are introduced into the respective metal bath from above and the withdrawal of the gases from said chambers is effected above the level of the metal bath while the heat absorbing medium flows through the chambers in counter-current flow to the gases, and the exchanger surfaces are so designed that the metal bath temperature in the serially first chamber is the highest.

3,716,046
APPARATUS AND METHOD FOR ROTATIONALLY INDUCING AND MEASURING NYSTAGMUS

Charl E. Janeke, Brooklyn, Pretoria, Republic of South Africa, assignor to Tracoustics, Inc., Denver, Colo.

Filed April 27, 1971, Ser. No. 137,822
Int. Cl. A61b *5/04, 3/00*
U.S. Cl. 128—2.1 R 21 Claims

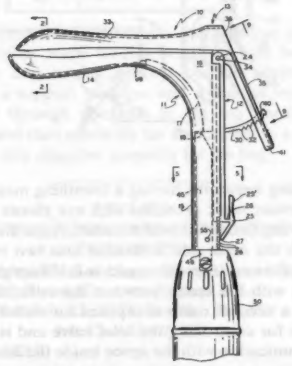


Apparatus and method for rotationally inducing nystagmus in the horizontal plane, the apparatus including a chair pivotal about an upward directed axis and biased to an at-rest position, tensioning of the biasing means and adjustable lateral weights providing means for damping the periodicity of the sinusoidal chair movement.

3,716,047
DISPOSABLE LIGHT-CONDUCTIVE SPECULUM

William C. Moore, Skaneateles, William S. Pilgrim, Port Byron, and Melvin R. Caldwell, Greene, N.Y., assignors to Welch Allyn Inc., Skaneateles Falls, N.Y.

Continuation-in-part of abandoned application Ser. No. 718,472, Apr. 3, 1968. This application Dec. 21, 1970, Ser. No. 99,967
Int. Cl. A61b *1/06*
U.S. Cl. 128—18 1 Claim

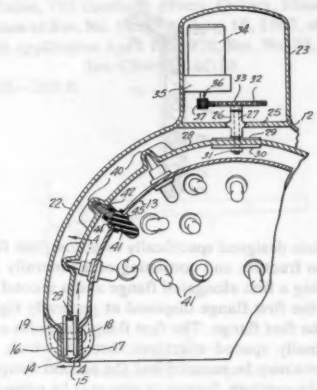


A three piece vaginal speculum including a fixed blade with integral depending hollow handle and a forked slide member carried on the handle. A pawl integral with the slide is selectively engageable with teeth on the handle. A movable blade is pivotally carried on the fork ends of the slide and has an integral lever projecting proximally. An integral slide tongue has teeth selectively engageable with an abutment on the lever. The three parts are molded plastic and a portion of the fixed blade is adapted to carry light from a source in the handle toward the blade ends.

3,716,048
HEAD MASSAGE MACHINE

Jose Luis Alonso, Miami, Fla., assignor to Alfredo Figueras, Jr., Miami, Fla.

Filed July 30, 1971, Ser. No. 167,629
Int. Cl. A61h *7/00*
U.S. Cl. 128—49 8 Claims

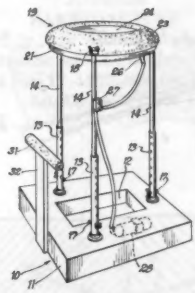


A head massaging machine consisting of a hollow double-walled helmet having a rotary inner shell member formed with sinusoidal cam channels. Resiliently mounted in the inner wall of the helmet are inwardly projecting resilient head-massaging fingers provided with rigid follower pins engaged in the cam channels. A motor mounted in the helmet rotates the shell member, causing the massaging fingers to oscillate, to thereby provide the head-massaging action.

3,716,049
THERAPEUTIC TRACTION APPARATUS

Mitchell M. Kaplan, 5240 West Cornelia Ave., Chicago, Ill.

Filed March 25, 1971, Ser. No. 127,960
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 9 Claims



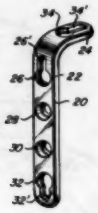
A therapeutic apparatus for applying suspension traction to a person to alleviate certain types of backaches. The apparatus includes an annular support member supporting an inflatable rubber-like tube. When the tube is in deflated condition the body of the person may be passed through the opening of the annular member. After the tube encompasses the body of the person below the armpits, the tube is inflated to engage the body in snug circumferential relation and, in such condition, the tube cooperates to support the person so that the lower portion of his body is suspended. An air compressor and controls within easy reach of the person are provided for effecting inflation or deflation of the tube.

3,716,050

OLECRANON PLATE

Furnie W. Johnston, 303 Whatley Dr., Dothan, Ala.

Filed Feb. 11, 1971, Ser. No. 114,454
Int. Cl. A61f 5/04
U.S. Cl. 128—92 D 3 Claims



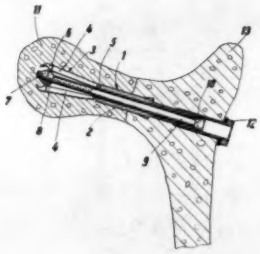
A bone plate designed specifically to accomplish fixation of an olecranon fracture and consisting of a generally L-shaped plate including a first elongated flange and a second flange at one end of the first flange disposed at generally right angles relative to the first flange. The first flange includes a plurality of longitudinally spaced apertures through which bone attaching screws may be secured and the second flange also includes a single aperture. Screws or pins may be passed through the aperture in the second short flange and the adjacent aperture in the longer flange and anchored in the proximal fragment so as to fix and position the latter relative to the plate and the remaining portion of the long flange is then secured by screws or pins to the distal ulna after the fracture is compressed.

3,716,051

EXPANDIBLE CONNECTOR FOR FRACTURED BONES

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed Sept. 8, 1971, Ser. No. 178,598
Claims priority, application Germany, Sept. 10, 1979, P 20 44 773.8
Int. Cl. A61f 5/04
U.S. Cl. 128—92 BB 5 Claims



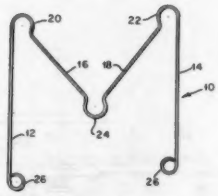
A sleeve has a trailing end portion which is to be lodged in one fragment of a fractured bone, and an open-ended expansible leading end portion which is to be lodged in the other fragment, so that the sleeve bridges the fracture. The leading end portion is subdivided by a plurality of longitudinal slots into radially expansible shanks. A threaded member extends through a central passage of the sleeve, and in this passage adjacent the leading end of the leading end portion is located an expander member an exposed end face of which faces the open end. Integral parts of the expansible shanks extend at the open end transversely of the central passage at least to a threaded bore provided in the expansion member, in which bore the threaded element engages.

3,716,052

INTRAUTERINE CONTRACEPTIVE DEVICE

Marc E. Chaft, 8 Tripplet Road, Somerset, N.J.

Division of Ser. No. 742,984, July 5, 1968. This application April 21, 1971, Ser. No. 135,984
Int. Cl. A61f 5/46
U.S. Cl. 128—130 6 Claims



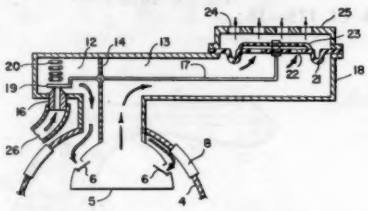
An intrauterine device formed of leaf spring material. The device is in the form of an M and having enlarged rounded joints which are longitudinally offset relative one another to make possible greater compactness when compressed for insertion into the uterus.

3,716,053

BREATHING APPARATUS

Hans O. Almovist, Lidingo, Sweden, and Sigurd A. Backlund, Vasa, Finland, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed March 12, 1971, Ser. No. 123,708
Claims priority, application Sweden, March 12, 1970, 3260/70
Int. Cl. A62b 7/04
U.S. Cl. 128—142.2 2 Claims



A breathing apparatus having a breathing mask which consists of an outer mask provided with eye pieces and an inner mask enclosing the mouth and the nose. A gas chamber is connected with the mask and is divided into two rooms. A first room comprises an inlet valve and is in direct gas fluid communication with the space between the outer and the inner mask, and a second room comprises an outlet valve and a membrance for controlling the inlet valve and is in direct gas fluid communication with the space inside the inner mask.

3,716,054

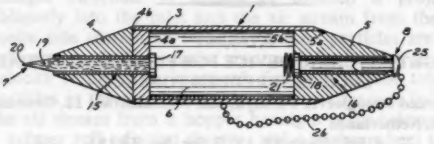
APPARATUS FOR APPLYING MEDICATION TO TEETH AND BODY TISSUE

William I. Porter; Frank W. Hindsley, and James E. Hesse, all of Albuquerque, N. Mex., assignors to William A. Porter, Albuquerque, N. Mex.

Filed Aug. 11, 1970, Ser. No. 62,860
Int. Cl. A61m 5/00
U.S. Cl. 128—172.1 6 Claims

Disclosed is a porous medication impregnated carrier for applying medication to a patient's teeth or body tissue. Dis-

closed also is structure for holding the carrier and connecting it to a D.C. voltage source, thereby to form apparatus which utilizes a small electric current to impel the medication into



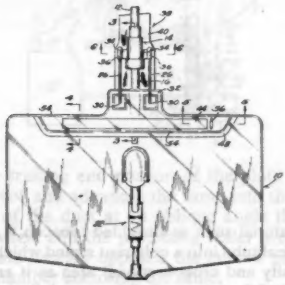
the patient's teeth or body tissue. The apparatus may be constructed to be portable, battery powered and for operation by the patient himself.

3,716,055

SUPPORT APPARATUS FOR A BEDSIDE DRAINAGE BAG

Wolfram M. Schultze, New Berlin, Wis., assignor to Plastronics, Inc., Milwaukee, Wis.

Filed Aug. 2, 1971, Ser. No. 168,209
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **8 Claims**



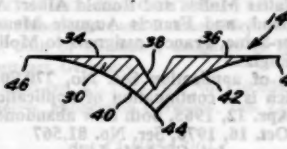
A support apparatus for a bedside drainage bag comprising a support member made from a length of wire bent to the desired shape and having a hook portion adapted to be hooked over a support member and a pair of vertical legs which extend through openings in the top portion of the drainage bag and then upwardly for attachment to a semi-rigid portion of the drip chamber assembly for the bag.

3,716,056

VASECTOMY PROCEDURE AND INSTRUMENT FOR USE THEREWITH

Stuart A. Brodsky, 271 Love Lane, Warwick, and Raymond A. Kelly, 19 Eddy Street, Cranston, both of R.I.

Filed Feb. 22, 1971, Ser. No. 117,579
Int. Cl. A61b *19/00*
U.S. Cl. 128—303 R **6 Claims**



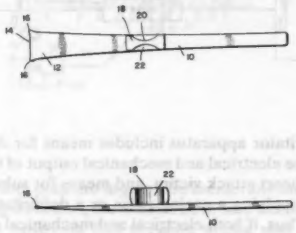
A vasectomy procedure and instrument for use therewith that provides for elevating the vas deferens from the scrotal sac of the patient for severing of the vas while it is in the elevated position, the instrument having an arcuate shaped head provided with a central longitudinally extending groove that acts as a base for the severing tool during the severing operation of the vas.

3,716,057

GUARDED DORSAL OSTEOTOME WITH STABILIZER

Frank F. Rubin, 795 Southern Artery, Quincy, Mass.

Continuation of Ser. No. 660,766, Aug. 15, 1967, abandoned.
This application April 13, 1970, Ser. No. 28,185
Int. Cl. A61b *17/16*
U.S. Cl. 128—305 R **1 Claim**



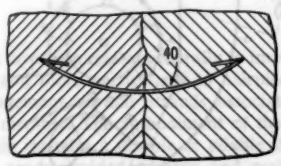
A chisel for cutting bony tissue has a sharp cutting edge at one end. At the ends of the edge are slightly thickened and rounded elements which guard against accidental side-slips of the cutting end of the chisel. The slightly thickened ends which are called Guards also show the depth and position of the chisel in the bone. Its purpose is to prevent removing too much nasal bone as well as to prevent the chisel from cutting the skin along the edge of the chisel. A gripping element to be grasped by the thumb and a finger at an intermediate point on the chisel is effective in preventing deflection of the cutting end of the chisel by the grain of the bony tissue, which could result in removing bone from the nasal dorsum in an oblique manner.

3,716,058

BARBED SUTURE

James C. Tanner, Jr., c/o Atlanta Research Institute, Suite 705, 384 Peachtree Street N.E., Atlanta, Ga.

Filed July 17, 1970, Ser. No. 55,927
Int. Cl. A61b *17/04*
U.S. Cl. 128—337 **4 Claims**



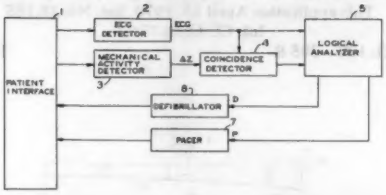
A surgical suture useful in closing incisions, lacerations and wounds of human tissue comprising a relatively short section of rigid or flexible suture material with a return barb on both ends. The suture may be flat or arcuate and may contain single or multiple barbs on the ends. A notched and slotted needle is useful in inserting flexible sutures.

3,716,059

CARDIAC RESUSCITATOR

Warren S. Welborn, Portland, and Melvin A. Holznagel, Sherwood, both of Oreg., assignors to Cardiac Resuscitator Corporation, Portland, Oreg.

Filed Aug. 24, 1970, Ser. No. 66,189
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D 17 Claims



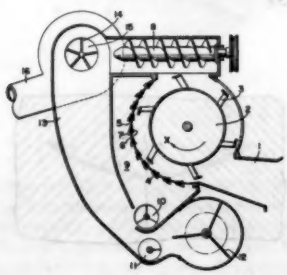
A resuscitator apparatus includes means for detecting and counting the electrical and mechanical output of the heart of a suspected heart attack victim, and means for substantially immediately applying a pacing pulse or a defibrilating pulse, as required. Thus, if both electrical and mechanical outputs have low rates, or are nonexistent, a pacing pulse is automatically applied for stimulating a heart beat in time with such pulse. However, if electrical activity is present while mechanical output is absent, indicative of ventricular fibrillation, a defibrillating pulse is applied to the patient. If both electrical and mechanical activity are present, indicative of substantially normal operation, appropriate indication is given, and no corrective action is taken. The apparatus attaches to the patient for administering the correct electrical stimulation to the patient as soon as possible after the occurrence of the suspected attack.

3,716,060

CONCAVE FOR TAKING OFF RACHIS BRANCH IN THRESHING MACHINE FOR COMBINED HARVESTER-THRESHERS

Miyoshi Suzue, 1343–1 Higashizaki, Nankoku-shi, Kochi-ken, Japan

Filed July 1, 1971, Ser. No. 158,950
Int. Cl. A01f *12/24*
U.S. Cl. 130—27 K 3 Claims



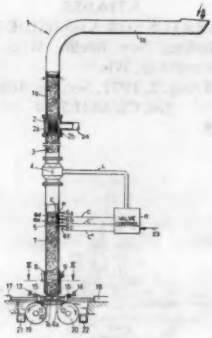
This invention provides a concave for taking off rachis branch comprising the threshing blades and concave bars secured to the interior and exterior surface of the concave blank at each location between any two parallel rows of perforations provided in said concave blank, said threshing blades and said concave bars being opened to the direction opposite to the rotating direction of a threshing drum thereby to increase the threshing advantages.

3,716,061

WEIGHT BATCHING DEVICE FOR FIBROUS MATERIAL SUCH AS SHREDDED TOBACCO

Koenraad Droogleever Fortuyn, Star Numanstraat 12, Groningen, Netherlands

Filed March 27, 1970, Ser. No. 23,181
Claims priority, application Netherlands, April 3, 1969, 6905203
Int. Cl. A24b *03/00*
U.S. Cl. 131—22 A 32 Claims



Fibrous material such as shredded tobacco is first formed within a vertical tube into a coherent strand which possesses a uniform density and cross-sectional area as it emerges from the lower end of the tube so that the strand displays a uniform weight per unit of length. A selected length of the coherent strand is exposed below the tube and this exposed length is then evenly divided in two longitudinally divided parts which are pulled loose from the strand in opposite lateral directions to provide two substantially equal weight batches. As the batches are separated or pulled loose laterally, the coherent strand is restrained laterally just above the zone in which pulling apart is effected so that the weight of each batch is predictably related to the length of the exposed part of the strand which is below this restraining apparatus. After the batches are pulled away, the strand drops and presents a new exposed length and further batches are formed. Two or more batches may later be recombined to provide a desired-weight portion of the material.

3,716,062

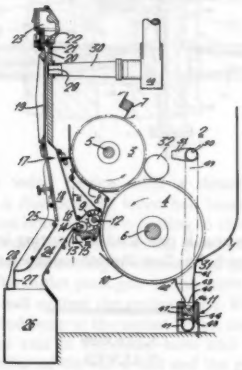
CIGARETTE-MAKING MACHINES OF THE CONTINUOUS-ROD TYPE

Desmond Walter Molins and Ronald Albert Ahern, London, England, and Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England

Continuation of application Ser. No. 770,905, Oct. 23, 1968, which is a continuation of application Ser. No. 447,368, Apr. 12, 1965, both now abandoned. This application Oct. 16, 1970, Ser. No. 81,567
Int. Cl. A24c *5/39*
U.S. Cl. 131—110 32 Claims

A continuous-rod cigarette-making machine of the type in which tobacco is carried by an air stream to a suction

conveyor on which the tobacco filler is formed. The air stream is directed obliquely from one side into the inlet of a duct leading to the conveyor so that the air stream changes direction as it enters the duct resulting in a velocity gradient across the width of the air stream as it changes direction. A stream of tobacco is projected obliquely into the inlet and the air stream from the opposite side thereof so that the tobacco particles are first subjected to the side of the air stream having the greatest velocity resulting in improved dispersion of the tobacco particles in the air stream. The tobacco stream is fed into the air stream from a hopper having a carded drum and a refuser roll adjacent thereto, and a picker wheel to remove tobacco from the carded drum. The picker is placed adjacent to a curved plate and is arranged to advance the tobacco to a projecting roller which grips the tobacco



between the trailing end portion of the plate and the periphery thereof and advances the same into the air stream at the inlet of the duct at an oblique angle thereto. Both the picker wheel and the projecting roller are covered by a second plate located opposite the curved plate, thereby forming a chamber enclosing the same.

3,716,063

SELECTIVE GAS PHASE FILTER MATERIAL

Elmer Francis Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sept. 25, 1970, Ser. No. 75,773

Int. Cl. A24b *15/02*; A24d *1/06*

U.S. Cl. 131—267 **9 Claims**

An improved tobacco smoke filter material is formed from a porous particulate carrier impregnated with an additive having an affinity for volatile smoke acids and aldehydes, such as buffered polyethyleneimine, wherein the carrier particles have a pore diameter from 0.1 to 2.0 microns, a surface area of from about 1 to 15 square meters per gram, and a pore volume no less than about 0.3 cubic centimeter per gram.

3,716,064

FUEL INJECTION SYSTEM WITH TEMPERATURE-COMPENSATED CONTROL VALVE

Walter Bosch, Hohenacker, and Reinhard Schwartz, Stuttgart-Sillenbuch, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

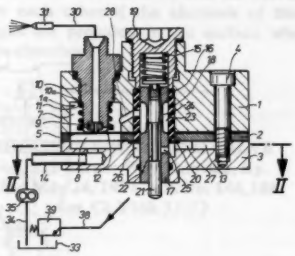
Filed Jan. 27, 1971, Ser. No. 110,051

Claims priority, application Germany, Jan. 12, 1970, P 20 06 305.2

Int. Cl. G05d *7/01*

U.S. Cl. 137—501 **3 Claims**

In a fuel distributor — in which the fuel to be delivered to a cylinder of an internal combustion engine is dosed by a metering valve — in order to maintain at a constant value the difference between the fuel pressure upstream of and downstream of the metering valve, there is provided a plurality of control valves (one for each cylinder) each having a flat seat whose flow passage section is variable by a movable membrane. One side of said membrane is exposed to the



downstream fuel pressure urging said membrane into a control valve opening direction, the other side of said membrane is exposed to the upstream fuel pressure urging said membrane into a control valve closing direction. The membrane is so constructed that temperature fluctuations do not affect its tension.

3,716,065

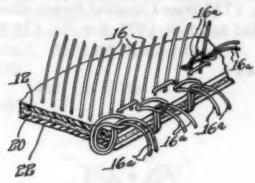
HAIRPIECE

Paul V. Finamore, Chicago, Ill., assignor to World of Wigs Mfg. Co. Inc., Chicago, Ill.

Filed Sept. 25, 1970, Ser. No. 75,604

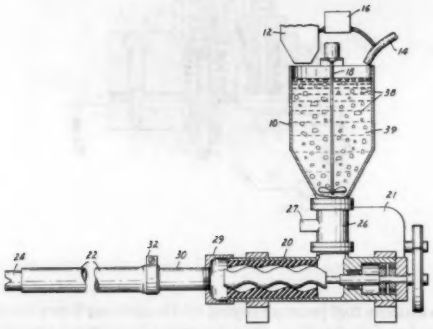
Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **1 Claim**



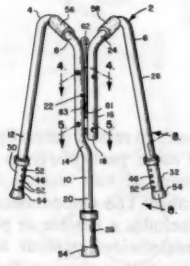
The present invention relates generally to improvements to hairpieces and more particularly to hairpieces having a novel arrangement of hair strands associated with a flexible sheet member. The embodiment of the invention disclosed herein includes a flexible or pliable sheet member having a predetermined contour and peripheral dimension conforming with a given surface area of a user's head. A plurality of adjacently positioned hairstrands are associated with the outer surface of the sheet member which, in the aggregate, afford the external appearance of natural hair. Each strand comprises a given length having sections penetrating the sheet at adjacently spaced intervals, the intermediate portion of each strand adhesively secured to the undersurface of the sheet member.

3,716,066
AIRCRAFT CLEANING
John W. Currier; Richard T. Gadbois, and Arthur G. Wilde, all of St. Paul., Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 2, 1970, Ser. No. 42,833
Int. Cl. B08b 7/00
U.S. Cl. 134—7 **5 Claims**



Apparatus and method for cleaning the exterior surface of aircraft using a cleaning solution and small, light, resilient, liquid-absorbent bodies that are insoluble in the cleaning solution which are mixed in a chamber in a controlled volume ratio to produce a uniform suspension. The uniform suspension is moved from the mixing chamber and is impelled from a nozzle at a controlled velocity to impact against and clean the exterior surface of the aircraft spaced from the nozzle.

3,716,067
INVALID SUPPORT
Folke E. Skoog, 1722 West Chestnut Street, Glenview, Ill.
Filed April 20, 1971, Ser. No. 135,582
Int. Cl. A45b 1/00
U.S. Cl. 135—45 A **8 Claims**

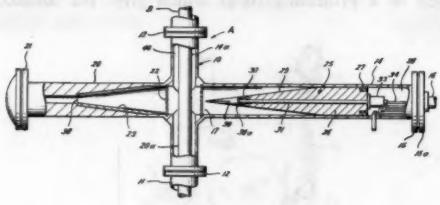


A foldable three-legged invalid support having a pair of U-shaped side frames, the forward legs of the side frames being pivotally interconnected to form a V and the connection having a yieldable frictional resistance which permits controlled adjustment of the spacing of the frames to the comfort of the user and stabilizes the structure.

ERRATUM

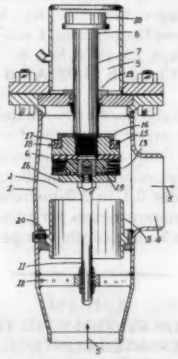
For Class 137—67 see:
Patent No. 3,716,064

3,716,068
SURFACE CONTROLLED BLOWOUT ARRESTER
Frank F. Addison, Drawer 3743, Lafayette, La.
Filed June 11, 1971, Ser. No. 152,111
Int. Cl. E21b 29/00
U.S. Cl. 137—67 **5 Claims**



A valve apparatus is provided for cutting into and deforming a flow line such that flow therethrough is arrested.

3,716,069
VALVES
Robin Francis Norman Reynolds, Sandton, Transvaal, South Africa, assignor to African Wire Ropes Limited, Johannesburg, Transvaal, South Africa
Filed Dec. 8, 1970, Ser. No. 96,205
Claims priority, application South Africa, Dec. 10, 1969, 698598
Int. Cl. F16k 15/06
U.S. Cl. 137—244 **8 Claims**

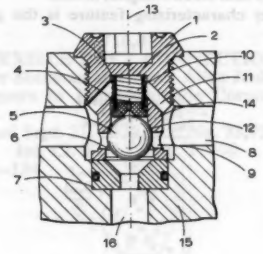


A valve closure member formed as a piston in a sleeve with the valve being lifted out of the sleeve to enable slurry to pass, the piston being supplied with a special wiper provided to clean the sleeve on reciprocation therein with the valve also being guided back into the sleeve on closure. A peripheral track is provided around the sleeve to act as a trap for pebbles passing through the sleeve.

3,716,070
NON-RETURN VALVE DEVICES

Bruno Klimkiewicz, 4628 Altlunen, and Walter Weirich, Dortmund, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Westfalia, Germany

Filed Dec. 31, 1970, Ser. No. 103,093
Claims priority, application Germany, March 14, 1970, P 20 12 297.8
Int. Cl. F16k 17/34
U.S. Cl. 137—484.2 6 Claims

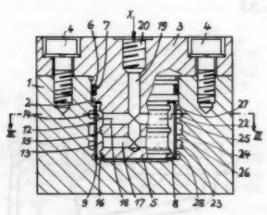


A non-return valve device with a detachable control member having a displaceable valve ball biased by a spring disposed in a blind bore against a seating to close radial cross bores communicating with main outlet passages. The seating has a through bore permitting pressure fluid to pass from an inlet passage to the outlet passages via the cross bores thereby urging the valve ball against the spring force. Relief bores extend from the blind bore to the outlet bores, and are inclined in relation to the axis of the blind bore and the clearance between the exterior of the valve ball and the guiding surface of the member is made sufficiently small so that fluid flow through the cross bores and the outlet passages will established suction in the relief bores to urge the valve ball against the spring force and remove the latter from the fluid flow path.

3,716,071
FLUIDIC LOGIC DEVICE

Walter Passera, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 7, 1971, Ser. No. 187,431
Claims priority, application Germany, Oct. 9, 1970, P 20 49 612.2
Int. Cl. F16k 7/17
U.S. Cl. 137—594 20 Claims

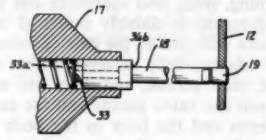


A pneumatically or hydraulically operated fluidic logic device wherein a housing defines a ring-shaped chamber which communicates with fluid-supplying and fluid-discharging first and second passages as well as with a third passage for admission of a control fluid stream at a variable pressure. An elastically deformable split ring is received in the chamber with freedom of radial movement to seal the first and second passages from each other in response to a rise of fluid pressure in the third passage. The third passage has one or more channels machined into the surface which surrounds or is surrounded by the chamber, and each of the first and second passages has one or more channels machined into the surface which is surrounded by or surrounds the chamber. The split ring can be expanded to seal the first and second passages from each other if the channels of these passages are provided in the surface which surrounds the chamber, and the split ring is caused to contract and to thereby seal the first and second passages from each other if the channels of the first and second passages are provided in the surface which is surrounded by the chamber.

3,716,072
PRESSURE EQUALIZING VALVE

Dick M. Criswell, 529 Barbee Way, Danville, Ky.

Filed May 24, 1971, Ser. No. 146,185
Int. Cl. F16k 31/12
U.S. Cl. 137—510 5 Claims

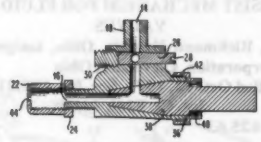


Disclosed is an assembly, including a filter and pressure equalizing valve, for relieving the interior of a burial casket of moisture and odor. The valve utilizes a thin, resilient disc or wafer, preferably formed of polyethylene, which is flexed into a substantially concavo-convex configuration to unseal an outlet port when a relatively small pressure differential (of the order of one-half inch water column) exists on the opposite sides of the disc.

3,716,073
ROTARY PLUG SHUT-OFF VALVE ASSEMBLY

H. Alan Terwilliger, 30 Arlmont St., Kingston, N.Y. 12401

Continuation-in-part of application Ser. No. 501,873, Oct. 22, 1965. This application Apr. 7, 1969, Ser. No. 824,339
Int. Cl. F16k 43/00
U.S. Cl. 137—613 1 Claim

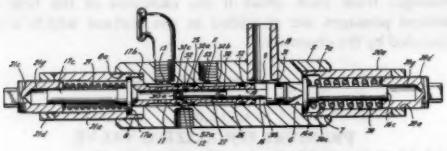


A combined rotary plug shut-off valve includes a rotary plug section having inlet and outlet port sections at opposite ends of a flow passage for supplying domestic gas to a burner unit. A flow limiting device having an opening adapted to register with the flow passage of the valve is mounted between the inlet and outlet port sections, and adapted for rotational adjustment with respect to the flow passage for obstructing the gas flow through the rotary plug to permit servicing of said rotary plug or its associated burner unit without retarding the main gas supply.

3,716,074
COMBINATION HIGH AND LOW PRESSURE CUTOFF CONTROL VALVE

Clifford M. Peters, 16 Rockwall Drive, Longview, Tex. 75601

Filed Sept. 7, 1971, Ser. No. 178,062
Int. Cl. F16k *11/07, 11/10*
U.S. Cl. 137—625.6 **3 Claims**



A valve for shutting off a fluid medium in response to pressure variations in a source exceeding a predetermined maximum and falling below a predetermined minimum wherein a longitudinal bore in the body communicates with an opening, inlet, and outlets in the valve body. A pair of valve means is slidably mounted in the longitudinal body bore with one of the pair of valve means being slidably and telescopically received within a bore in the other pair of valve means, and there are seal means for sealing between the valve means and for sealing between the valve means and the bore in the body on each side of the opening to form a chamber within which the pressure from the source is received to act on the pair of valve means to maintain them in a predetermined telescoped relation when the pressure in the source is between the predetermined maximum and minimum.

The valve means are provided with suitable passages and cooperating seal means so that when they are in the predetermined telescoped relation, the fluid medium passes through the valve from the inlet to one of the outlets. The valve means are provided with additional seal means and ports, or passages, so that when the pressure in the flow conduit either exceeds the predetermined maximum or falls below the predetermined minimum, the valve means move to a different telescoped relation so that the fluid pressure medium, instead of being discharged from the inlet to the outlet, is shut off in the valve body, and the outlet which was receiving the fluid pressure medium is connected to discharge to atmosphere through another outlet in the valve body. Adjustable means are provided for urging the pair of valve means to predetermined telescoped relation and for varying the predetermined relation.

3,716,075
POWER ASSIST MECHANISM FOR FLUID CONTROL VALVES

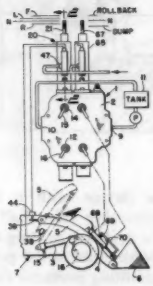
John C. Paul, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 12, 1971, Ser. No. 188,218
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.63 **9 Claims**

A power (hydraulic or pneumatic) assist mechanism for a spool valve assembly and the like characterized in that a manually actuated control valve member has a lost motion spring connection with the spool to selectively vent either side of a double acting fluid motor whose piston is connected to the spool so that fluid pressure in the unvented side of the motor is effective to move the piston and spool in the same direction as the movement of the control valve member. The invention is further characterized in the provision of a shuttle valve member which is guided in the cylinder housing of the power assist mechanism in such manner as to define annular orifices of uniform radial width between the ends of said shuttle valve member and a surrounding bore in the cylinder housing, the differential pressure drops across said orifices due to fluid flowing to the vented and unvented sides of said power assist motor being effective to move the shuttle valve member to a position restricting continued flow to the vented side of said motor.

Another characterizing feature of this invention is the provision of a power assist mechanism having a portative electromagnetic means operatively connected to the spool so as to constitute a latch or detent to retain the spool in a selected operating position until released either by operation of the aforesaid manually actuated control valve member or by de-energization of said electromagnet means.

Yet another characterizing feature is the provision of a



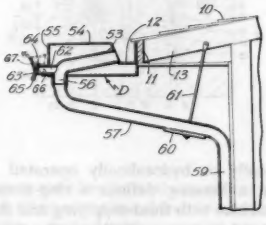
power assist mechanism having means which imparts an added load on the manually actuated control valve member to provide a sensory indication of an intermediate operating position of the spool from which the actuation of the control valve member and spool may be continued under such added load to another operating position whereat said control valve member and spool are retained by electromagnetic means until released as aforesaid.

Yet another characterizing feature is that in the case of a pneumatic power assist mechanism check valves are provided between the aforesaid shuttle valve and the chambers on opposite sides of the power assist piston, and a stabilizing orifice intercommunicates said chambers to minimize fluttering of the power assist assist piston and the spool.

3,716,076
RAIN TROUGH DEVICES

Alvin W. Franzmeier, 1042 Jenks Ave., St. Paul, Minn.

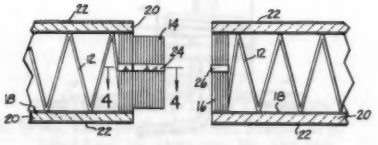
Filed Dec. 7, 1970, Ser. No. 95,610
Int. Cl. E03b *7/12*; **F16l** *53/00*
U.S. Cl. 138—32 **11 Claims**



A drain-spout is provided which communicates with the rain gutter of a building from the outside wall thereof with the

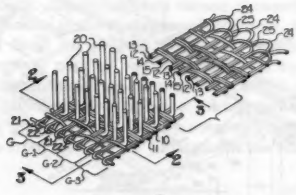
rain gutter near the upper portion thereof as well as the bottom, in order to drain water from the surface of the rain gutter. The down-spout extends angularly and downwardly to deliver the water to a point spaced outwardly from the rain gutter so as to prevent the dripping of water onto any sidewalk beneath the eaves. The down-spout is enclosed in an outer enclosure which is heated by the sun rays or by auxiliary means.

3,716,077
FLEXIBLE DUCT CONNECTION
James Webster Sherman and Terry Allen Jenkins, Toledo, Ohio, assignors to Johns-Manville Corporation, New York, N.Y.
Filed Sept. 21, 1970, Ser. No. 73,754
Int. Cl. F16l *11/10, 21/00*
U.S. Cl. 138—134 **3 Claims**



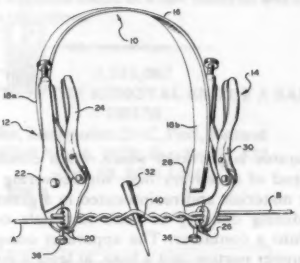
A flexible insulated air duct formed by wrapping blanket insulation about a helically wound wire-like elongate tubular skeleton wherein the opposite ends of the helical windings are closed wound and secured together to form rigid collars of different diameters to define male and female connections whereby sections of such duct may be axially connected one to another.

3,716,078
WOVEN PILE FABRICS
Eugene F. Clark, deceased, by Ursa W. Clark, heir, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.
Filed Nov. 3, 1971, Ser. No. 195,293
Int. Cl. D03d *27/16*
U.S. Cl. 139—399 **10 Claims**



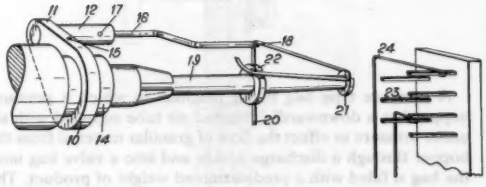
A pile fabric having a base formed of ground warps arranged in a pair of banks interwoven with successive groups of wefts, and each group of wefts including a plurality of pairs of wefts. The respective banks of warps extend in opposition to each other successively over and under the successive groups of wefts with the warps crossing each other only at the juncture of adjacent groups of wefts, and weftwise rows of substantially U-shaped pile tufts are looped beneath only one pair of wefts in each respective group.

3,716,079
WIRE SPLICING DEVICE
Frank J. Marshall, Sullivan Road, R.D. 2, Oneida, N.Y. 13421
Filed Sept. 20, 1971, Ser. No. 181,665
Int. Cl. B21f *15/04*
U.S. Cl. 140—120 **8 Claims**



A device for twisting together the ends of two pieces of relatively heavy wire as in repairing broken wires in a fence. The device comprises a U-shaped spring metal strap on the ends of which are mounted a pair of locking wrenches. The ends of the two wires to be twisted together or spliced are locked in the jaws of both wrenches in overlapping side-by-side relation. A tool such as a marlin spike is then inserted between the wires, approximately midway between the wrench jaws, and rotated to twist the wires together. As the twisting is effected, the locking wrenches are drawn closer together which causes the spring strap to exert an opposite, tension force on the wires whereby a very tight union of the wires is achieved.

3,716,080
WIRING DRESSING TOOL
Ernest Victor Scaddan, London, and Alan Clifford Heard, Hoddesden, both of England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Feb. 22, 1971, Ser. No. 117,363
Int. Cl. B21f *15/00*
U.S. Cl. 140—124 **7 Claims**



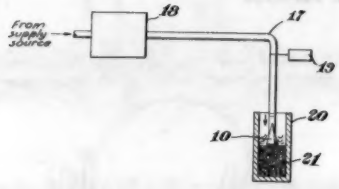
A dressing tool for attachment to a wire-wrapping gun forms a bend of predetermined angularity in the wire. The tool is mounted on an eccentric collar fitted onto the wire-wrap gun shank to extend parallel to the wrapping bit.

3,716,081

APPARATUS AND METHOD FOR TAMPING PARTICULATE MATERIALS INTO A CONTAINER

Gerald Landreville, Virginia, Minn., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 29, 1971, Ser. No. 128,976
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—12 10 Claims



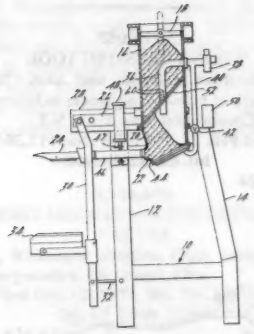
An apparatus is provided which when connected to the discharge end of a delivery hose for delivering free flowing particulate materials and reciprocated in a generally vertical direction during delivery of such materials compacts the materials into a container. The apparatus comprises a butt having an upper portion and a base, at least a portion of said upper portion decreasing in cross-sectional area from bottom to top, and a support means for attaching and aligning the butt below the discharge end of the delivery conduit so that the top of the butt faces the opening, and the longitudinal axis of the body is substantially in align with the longitudinal axis of the discharge end of the delivery conduit.

3,716,082

PRESSURE TYPE BAG FILLING MACHINE

John F. Green, Red Oak, Iowa, assignor to Douglas & Lomason Company, Detroit, Mich.

Filed Jan. 22, 1971, Ser. No. 108,812
Int. Cl. B65b *1/16, 1/16*
U.S. Cl. 141—68 1 Claim



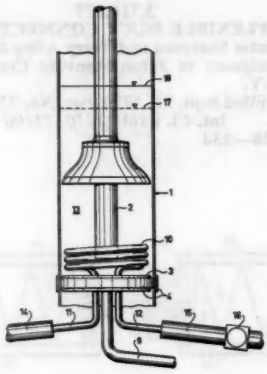
A pressure type bag filling machine in which a pressure hopper has a downwardly directed air tube supplied with air under pressure to effect the flow of granular material from the hopper through a discharge nozzle and into a valve bag until the bag is filled with a predetermined weight of product. The air tube extends through an inclined orifice plate which extends across the hopper and allows the product to accumulate in a small pile below the orifice plate over the discharge nozzle so that the pressure air can more easily initiate motion of the product and maintain substantially uniform flow of product through the nozzle, resulting in more rapid operation and more accurate weighing.

3,716,083

EQUIPMENT FOR CLEANSING AND/OR STERILISING THE FILLER TUBE IN PACKAGING MACHINES

Alex Tuma, Loddekopinge, and Jan Ingvar Hansson, Lomma, Sweden, assignors to AB Tetra Pak, Lund, Sweden

Original application Feb. 17, 1969, Ser. No. 799,560. Divided and this application Mar. 30, 1971, Ser. No. 129,644
Int. Cl. B65b *1/24, 3/04*; B67c *3/00*
U.S. Cl. 141—90 5 Claims



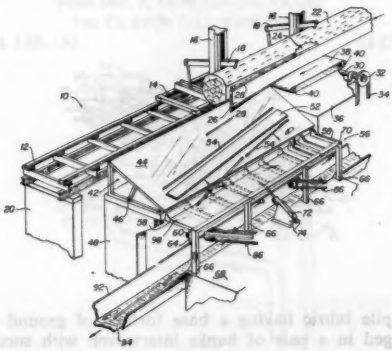
Apparatus for washing the filler tube of a liquid packaging machine with a washing agent including means for closing one end of the packaging tube to form a space thereabove and means for introducing a washing agent into the space and for heating the agent so as to cleanse and/or sterilize the filler tube extending into the packaging tube.

3,716,084

SAWMILL OFF BEARER

George W. Hartzell, and Robert J. Gunnerman, both of Piqua, Ohio, assignors to Hartzell Industries, Inc., Piqua, Ohio

Filed Feb. 13, 1970, Ser. No. 11,067
Int. Cl. B27b *31/08*
U.S. Cl. 143—157 D 9 Claims



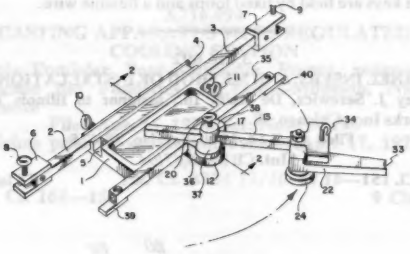
As boards are being cut from a log, they are moved over an inclined slide. When fully cut away from the log, the boards

fall down the slide away from the cutting area. To insure that longer boards are moved away from the saw blade a horizontal shelf may be mounted on the slide for temporarily supporting the leading end of the board. As the trailing end of the board is cut free, it falls down the slide and pulls the leading end off the shelf.

The slide is shown in association with two board handling systems. In one system a stop and dump assembly including arms for receiving the freshly cut board is mounted at the base of the slide. The arms are movable for also stopping the boards on the slide and for dumping trash therefrom.

The other system includes a screw roll conveyor mounted at the base of the slide adapted to convey cut boards longitudinally of the screw roll conveyor and parallel to the travel of the log from which the board is cut. Immediately adjacent the screw roll conveyor is a chain conveyor for conveying boards in a direction perpendicular to the movement of the log. To position the boards on the chain conveyor, one of the screw rolls remote from the saw blade is moved to an upper position to stop boards from moving longitudinally of the screw roll conveyor. The raised screw roll is still rotated so that it, along with the other screw rolls, tends to cam or convey the freshly cut boards in a direction perpendicular to the rotation of the rolls and onto the chain conveyor.

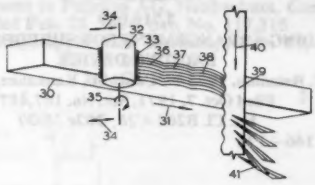
3,716,085
ROUTER TEMPLATE ATTACHMENT
Albert L. Wing, 1220 McKemy Street, Tempe, Ariz.
Filed Sept. 20, 1971, Ser. No. 182,009
Int. Cl. B27c 5/00
U.S. Cl. 144—144 R **2 Claims**



A router template attachment is provided for attachment to and use in conjunction with a known type of router template for the purpose of providing the capability for routing arcuate pattern portions. Adjustable arms extend outwardly for securing the attachment to the router template frame. A router support arm is fixed for pivotal movement between positions along an arcuate path of radius determined by sliding the router support arm over its pivot point at which it is fixed by means of a thumbscrew or the like. Circumferential travel is limited to a maximum of 180° by means of a stop member which slides from side to side to intercept the router support arm.

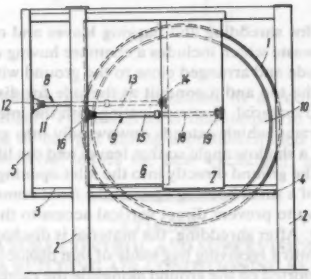
3,716,086
METHOD OF MANUFACTURING TOOTHPICKS
Rolf Barman, Olav Kyrresgk 45, Bergen, Norway
Division of Ser. No. 736,316, June 12, 1968, Pat. No. 3,563,253. This application Sept. 25, 1970, Ser. No. 75,479
Int. Cl. B27l 9/00
U.S. Cl. 144—326 R **17 Claims**

A toothpick of essentially triangular cross-section and tapered at both ends, one or both of the apex edge and base face thereof having an outwardly curved contour. A process for manufacturing said toothpicks involving forming V-shaped



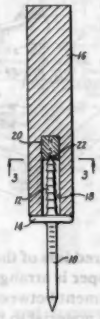
grooves of the requisite shape in a raw material and separating the toothpicks therefrom.

3,716,087
LOCK GATE OF THE REMOVAL END OF A BARKING DRUM
Rolf Erik Tuuha, Lansipuisto 20 C, Pori, Finland
Filed Nov. 6, 1970, Ser. No. 87,372
Int. Cl. B27l 1/04
U.S. Cl. 144—208 B **8 Claims**



A foldable lock gate for the removal end of a barking drum wherein two gate segments are mounted on a frame structure to be slidable relative to each other. The movement is effected by cylinder piston devices attached to each gate segment and to the frame structure.

3,716,088
NAIL DRIVER
Virgil E. Gray, 1033 Haverhill Street, West Sacramento, Calif.
Filed March 9, 1971, Ser. No. 122,375
Int. Cl. B25c 3/00
U.S. Cl. 145—46 **1 Claim**



A plain portion and a knurled portion extending from op-

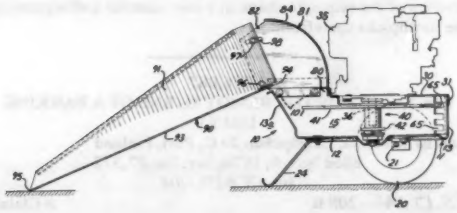
posite sides of a washer with the knurled portion magnetically secured within the bore of a rod.

3,716,089

FEEDING ARRANGEMENT FOR SHREDDING AND BAGGING DEVICE

James R. Bateman, 1905 W. Court St., Kankakee, Ill.

Filed Oct. 7, 1971, Ser. No. 187,417
Int. Cl. B26d 4/28; B02c 18/00
U.S. Cl. 146—192 **7 Claims**



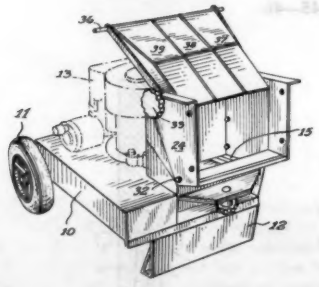
A device for shredding and bagging leaves and other yard and garden waste which includes a chamber having a horizontal rotary blade and arranged close to the ground with an inlet opening at the top and a conduit at the side for discharge of the shredded material. Communicating with the inlet opening is a flaring ramp which extends downwardly into ground engagement at a shallow angle so that leaves and the like may be swept from the ground directly into the inlet opening. A shield in the form of a small housing open at the front communicates with the ramp to prevent direct vertical access to the blade in the chamber. After shredding, the material is discharged from the conduit into a receiving bag made of thin plastic or the like which is supported on the ground alongside the ramp.

3,716,090

GARDEN SHREDDER WITH VARIABLE POSITION LOADING CHUTE

Robert D. Lautzenheiser, Bluffton, Ind., assignor to The Red Cross Manufacturing Corp.

Filed April 7, 1972, Ser. No. 242,043
Int. Cl. B26d 4/28; B02c 18/00
U.S. Cl. 56—501 **7 Claims**



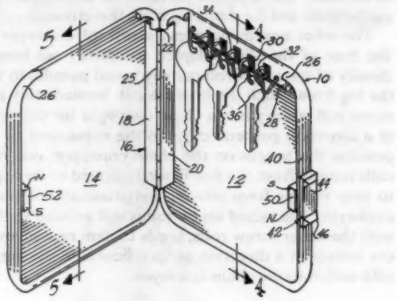
A loading chute for shredders of the type used to shred lawn materials. A loading hopper is arranged with the inlet opening of the shredder for movement between an upright position and a lower position wherein material to be shredded can be swept up the chute and into the shredder. A damper is arranged with the chute to act as a guard.

3,716,091

MAGNETIC CLOSURE

Alvin M. Gaines, 219 B Shadow Park, Gwinnette County, Near Norcross, Ga.

Filed Sept. 14, 1970, Ser. No. 71,696
Int. Cl. A45c 11/32; E05c 17/56
U.S. Cl. 150—40 **3 Claims**



A magnetic closure for keycases, pocketbooks, wallets, and other containers which provides a positive opening as well as a closing by means of magnets with respective North and South poles so positioned as to bring opposite poles into proximity for positive closing and like poles into proximity for opening. One panel of the keycase or other container is provided with the sliding magnet and another panel of the keycase has the fixed magnet whereby manually sliding one with respect to the other causes the magnets to assume the position of similar or dissimilar polarity.

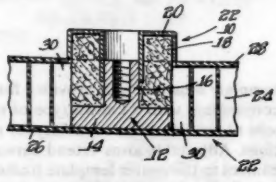
The keys are held by fixed loops and a flexible wire.

3,716,092

PANEL INSERT AND METHOD OF INSTALLATION

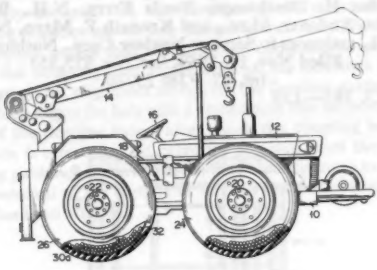
Aubrey J. Serewicz, De Kalb, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed April 14, 1970, Ser. No. 28,475
Int. Cl. F16b 37/04
U.S. Cl. 151—41.75 **7 Claims**



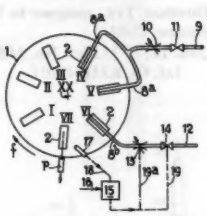
The present invention relates generally to inserts for panels and methods of assembling inserts with panels, and more particularly to insert structures for installation in relatively lightweight panels comprised of a honeycomb core and skin sheets secured to the opposite edges thereof, and to improved methods of assembling insert structures with such panels. The embodiment of the invention disclosed herein comprises an insert assembly having an internally threaded section extending from a base section adapted to be positioned adjacent the inner surface of the panel skin. Said insert assembly also includes an annular thermoplastic section adjacently surrounding the periphery of the threaded section. An annular collar, such as a sheet metal collar, adjacently superimposes the outer extremity of the annular section. Heat from or through said collar causes the annular section to melt and flow into a preformed aperture in the panel.

3,716,093
WHEELS FOR ROLLING STOCK
Shozo Tsuchiya, 160-4, Yugashima, Yugashima-machi, Amagi, Tagata-gun, Japan
Filed April 22, 1970, Ser. No. 30,915
Claims priority, application Japan, July 12, 1969, 44/66394
Int. Cl. B60b *19/06*
U.S. Cl. 152—330 1 Claim



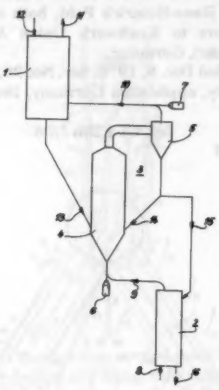
A wheel for rolling stock such as a tractor which comprises a wheel rim carrying a pneumatic tire having an annular tire cavity and a plurality of substantially spherical balls having a relatively high density, a packed layer of the ball partly filling the tire cavity. When the axis of the wheel is positioned horizontally, the wheel can have a gravity center at a lower point than the axis thereof due to the presence of the heavy balls positioned at the bottom portion of the tire cavity.

3,716,094
CASTING APPARATUS WITH REGULATED COOLING STATION
Claude Fuminier, Pont-a-Mousson, France, assignor to Societe des Fonderies de Pont-a-Mousson, Nancy, France
Filed Apr. 15, 1971, Ser. No. 134,196
Claims priority, application France, Apr. 17, 1970, 7013981
Int. Cl. B22d *13/10*
U.S. Cl. 164—154 9 Claims



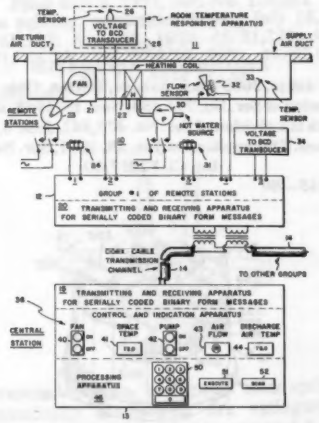
A foundry mould cooling apparatus for a mould turntable conveying the moulds between successive stations including a cleaning station, casting station, a first mould cooling station and a cast part extracting station. A complementary cooling station is provided following on the first cooling station and adapted to supply a complementary amount of cooling water which complements a minimum supply of water by the first cooling station. The amount of complementary water is governed by control means responsive to the temperature of a mould, for example the mould which has just left the cooling stations.

3,716,095
PROCESS FOR HEAT TREATMENT OF FINE GRANULAR MATERIAL
Horst Ritzmann and Wilfried Kruger, Neubeckum, Germany, assignors to Polysius AG, Neubeckum, Germany
Filed Feb. 22, 1971, Ser. No. 117,315
Claims priority, application Germany, Feb. 25, 1970, P 20 08 774.5
Int. Cl. F28
U.S. Cl. 165—1 2 Claims



Fine granular material is heated in a countercurrent heat exchanger. The material is maintained in circulation in a stream of hot gas during a predetermined dwell time after the material leaves the heat exchanger, and then is cooled.

3,716,096
TEMPERATURE CONTROL AND SUPERVISION SYSTEM FOR A BUILDING AIR CONDITIONING SYSTEM
James R. Berrett, Deerfield, and Roger J. Feulner, Mt. Prospect, both of Ill., assignors to Honeywell, Inc., Minneapolis, Minn.
Continuation of Ser. No. 864,679, Oct. 8, 1969, abandoned.
This application Sept. 7, 1971, Ser. No. 178,095
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 2 Claims



A temperature control and supervision system for controlling and supervising the operation of a building air conditioning system having a central station and a plurality of

remote stations connected by a single communication channel, wherein the control and supervision is accomplished by message transmitting and receiving apparatus at the central station and each of the remote stations for generating and interrogating serially coded messages comprising a plurality of bits in binary form.

3,716,097

AIR CONDENSATION PLANT

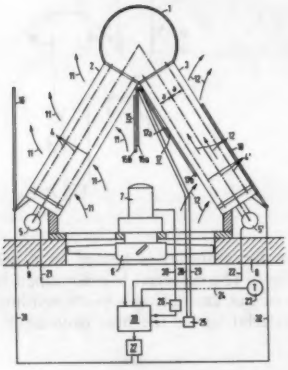
Fritz Kelp, and Hans-Heinrich Pohl, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Muhlheim (Ruhr), Germany

Filed Dec. 8, 1970, Ser. No. 96,071

Claims priority, application Germany, Dec. 11, 1969, P 19 62 061.2

Int. Cl. F28b *1/06*

U.S. Cl. 165—39 **16 Claims**



Air condensation plant for condensing steam by direct air cooling includes mutually transversely disposed elongated cooling elements traversible by steam along the length thereof, means for directing a flow of air to a respective side of said cooling elements, adjustable means for covering the side respectively of the cooling elements for controlling the cooling thereof and for preventing freezing, the cooling elements having an upper part through which a preponderant quantity of the steam to be condensated flows, the adjustable covering means being located in front of the upper part of the cooling elements.

3,716,098

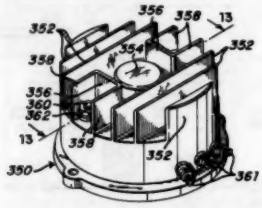
AUTOMOTIVE APPARATUS

Gianni A. Dotto, 3005 Claar Avenue, Dayton, Ohio

Continuation of Ser. No. 794,454, Nov. 15, 1968, abandoned, which is a division of Ser. No. 473,542, June 3, 1965, abandoned. This application Jan. 28, 1971, Ser. No. 110,667

Int. Cl. F28f *7/00*

U.S. Cl. 165—80 **3 Claims**



A semiconductor ignition apparatus including semiconductor means and a rotary capacitance means and inductance means wherein the rotary capacitor means and the inductance means cooperates to apply a determined value of reverse voltage to the semiconductor means when the capacitance value of the rotary capacitor means attains a determined value the semiconductor means is biased to non-conduction.

3,716,099

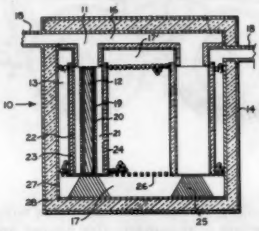
MEANS AND METHOD FOR OBTAINING HIGH TEMPERATURE PROCESS FLUIDS FROM LOW TEMPERATURE ENERGY SOURCES

Nicholas H. Deschamps, Reeds Ferry, N.H., Bernard Stein, Andover, Mass., and Kenneth E. Mayo, Nashua, N.H., assignors to Sanders Nuclear Corp., Nashua, N.H.

Filed Nov. 17, 1969, Ser. No. 877,357

Int. Cl. F28f *13/00*

U.S. Cl. 165—135 **42 Claims**



Means and methods are provided for obtaining useful heating of process fluids from a heat energy source which emits penetrating radiation to a surrounding radiation absorber. The absorber has a higher temperature than the source as a result of the penetrating radiation. The fluids are preferably passed over the source and through the absorber to obtained desired controlled heating of the fluids and simultaneous cooling of the source with the heated process fluids being capable of transmitting heat energy in a number of applications. Preferably the heat source is a beta or gamma radioisotope source with surrounding structure to maximize heat transfer to the fluid and minimize return heat flow. The absorber is preferably in a predetermined form to provide a predetermined heat transfer to the fluid under controlled conditions.

3,716,100

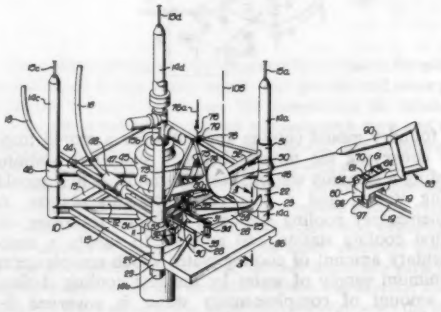
APPARATUS FOR ALIGNING AND CONNECTING FLOWLINES

Bobby H. Nelson, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Jan. 12, 1971, Ser. No. 105,927

Int. Cl. E21b *43/01*

U.S. Cl. 166—.6 **19 Claims**



One of more flowlines are to be connected to one or more companion flowline loops extending from a Christmas tree

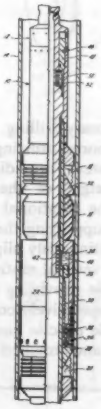
disposed at the upper end of a well bore extending into the formation from the floor of an ocean, or other body of water, at which a flowline guide structure has been installed. Prior to effecting the connection, the end portions of the flowlines are attached to a flange or hub releasably secured to a carrier at a flowline or pipe line barge, the carrier and flowlines being pulled toward the well by being fed from the barge to maintain the flowlines in tension. The pulling apparatus includes a single cable or pulling line connected to an orienting member of the carrier and passing through a guidance apparatus releasably mounted on the flowline guide structure. The orienting member moves into the guide structure. The orienting member moves into the guidance apparatus to properly orient the coupling hub at the ends of the flowlines for attachment to an alignment device on the flowline guide structure which aligns the hub with a companion hub secured to the ends of the flowline loops, after which the coupling between the hubs is effected. The carrier is released from the flange and the guidance apparatus from the guide structure to permit their removal to the surface of the body of water after alignment has been effected.

3,716,101

HEAT ACTUATED WELL PACKER

Harold E. McGowen, Jr., and Gilbert H. Tausch, both of Houston, Tex., assignors to Camco Incorporated, Houston, Tex.

Filed Oct. 28, 1971, Ser. No. 193,434
Int. Cl. E21b *33/128*
U.S. Cl. 166—60 **9 Claims**



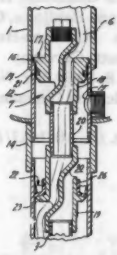
A heat operated well packer in which a closed pressure chamber includes a fluid that expands on the application of heat for providing the motive force for setting the packer. A well packer having a packing seal and slips which are actuated by a piston in which a closed pressure chamber having a nonexplosive fluid which expands upon the application of heat is in fluid communication with the piston, and heating means applies heat to the closed chamber for moving the piston and setting the packer. A setting tool releasably engaging the packer and including a second closed pressure chamber having a fluid which expands upon the application of heat for actuating a second piston for releasing the setting tool from the packer when heat is applied to the second pressure chamber.

3,716,102

WELL SYSTEM SEAL

Howard A. Tubbs, 406 South Elizabeth Street, Whitewater, Wis.

Continuation-in-part of Ser. No. 130,109, April 1, 1971. This application Aug. 24, 1971, Ser. No. 174,333
Int. Cl. E21b *33/03*
U.S. Cl. 166—88 **3 Claims**



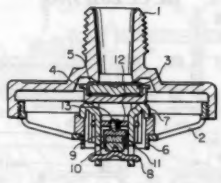
A well casing is divided into several parts by a coupling and a pair of packer bodies are hung within the casing with the coupling therebetween. Water and electrical conduit pass through the packer bodies, and the bodies are sealed to the casing wall to form a central pressurizable chamber so that water within the chamber pressurizes the inside of the coupling. A lower cup-shaped flexible sealing ring is provided with a generally vertical inner longitudinal wall, a generally flat horizontal base disposed at approximately 90° to the inner wall, and an outwardly tapering wall. The platform on which the sealing ring seats slants or is tapered substantially downwardly. When the chamber is unpressurized, the sealing ring takes its normal position, thus forming a tapered space between it and the platform. Under pressure, the ring distorts downwardly into engagement with the slanted platform, causing a substantial portion of its outer tapered wall to engage the casing, thus improving the seal.

3,716,103

SPRINKLER HEAD

Jun Tanaka and Hiroshi Onuki, Tokyo, Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed July 6, 1971, Ser. No. 159,691
Claims priority, application Japan, July 10, 1970, 45/68,332; Aug. 17, 1970, 45/81,230; Apr. 2, 1971, 46/23,635; June 28, 1971, 46/55,098
Int. Cl. A62c *37/30*
U.S. Cl. 169—42 **3 Claims**



The present invention is directed to a sprinkler head for automatically discharging fire extinguishing fluid immediately in response to heat generated by a fire or the like. The sprinkler head includes a collapsible heat sensitive assembly in which a pair of levers are provided to carry a packing support and a cylinder filled with a

low melting point metal, with the packing support being held in contact with the cylinder, and wherein a support plate for supporting the levers is outwardly displaced to allow the packing support to fall down on the opening of a deflector used as cover when the metal is melted and flows.

3,716,104

CONTROL DEVICE FOR THE POWER LIFTING INSTALLATION OF A TRACTOR

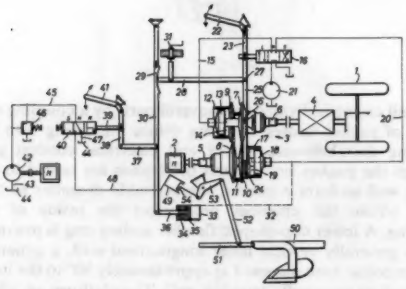
Walter Koenig, Bergisch Gladbach; Heribert Adams, Rosrath near Cologne, and Franz Heidjann, Oelinghausen, all of Germany, assignors to Klockver-Humboldt-Deutz Aktiengesellschaft, KolnrDeutz, Germany

Filed Dec. 8, 1969, Ser. No. 883,164

Claims priority, application Germany, Dec. 7, 1968, P 18 13 401.5

Int. Cl. A01b *63/112*

U.S. Cl. 172—7 **7 Claims**



A tractor with a power operated implement lift and a hydraulically adjustable speed transmission. The driving speed of the tractor is detected and the load torque on the tractor is detected and the detected driving speed and torque values are compared and produce a control movement when there is a decrease of speed of the tractor due to an increase of load torque on the tractor or vice versa. The control movement operates to cause the power operated lift to adjust the elevation of an implement connected thereto when there is a change in either the speed of the tractor or the load torque thereon without a change in the other in the same sense.

3,716,105

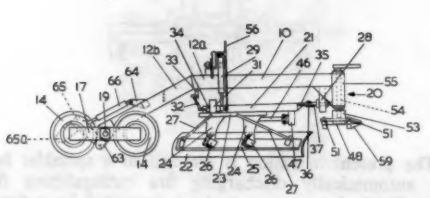
GRADING ATTACHMENT FOR A VEHICLE

Edwin Carey Hallam, Smeeton Westerby, England, assignor to E. C. Hallam Company, a partnership consisting of Edwin C. Hallam and Heather Hallam, Smeeton Westerby, Leicester, England

Filed Nov. 23, 1970, Ser. No. 91,928

Int. Cl. E02f *3/76*

U.S. Cl. 172—780 **12 Claims**



A trailing grading attachment for use with a tractor vehicle has its grader blade depending from the central part of a frame which is supported by rear wheels and by a forward towing connection that permits the trailer frame to pivot relatively to the tractor vehicle both about a vertical axis and about an approximately horizontal axis extending longitudinally of the tractor vehicle, and also has that part of the frame which extends forwardly from above the central part of the grader blade confined, as viewed in plan, to the region of the longitudinal center line of the trailer frame.

3,716,106

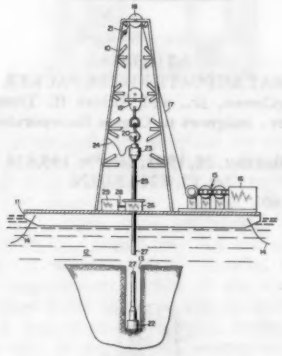
CONSTANTLY SLIPPING CLUTCH CONTROL FOR ROTARY DRILLING

Earl A. Peterson, 4111 Chestnut Ave., Long Beach, Calif.

Continuation-in-part of Ser. No. 810,322, March 25, 1969, abandoned. This application July 30, 1971, Ser. No. 167,713

Int. Cl. E21b *3/02, 19/08*

U.S. Cl. 173—1 **11 Claims**



A drilling system for rotary drilling. A drilling system for the rotary drilling of well bores utilizing a pair of cooperating subsystems, one subsystem providing for control of the penetration rate or weight of the drill bit, the second subsystem controlling the rotational speed or torque of the drill bit. A drawworks supporting the drill string is cooperatively engaged to a continuously slipping clutch to provide precise control over the vertical motion of the drill string and bit. The rotary drill table providing rotational power to the drill string and bit is cooperatively coupled to a continuously slipping clutch to provide precise control over the rotational motion of the drill string and attached drill bit.

3,716,107

DEVICE FOR OBTAINING EARTH SAMPLES

Jean Liautaud, Paris, France, assignor to Entreprise de Recherches et d'Activites Petrolieres (Elf), Paris, France

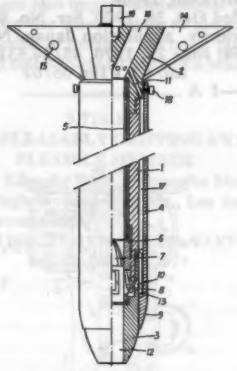
Continuation-in-part of abandoned application Ser. No. 887,657, Dec. 29, 1969. This application Mar. 10, 1971, Ser. No. 122,771

Int. Cl. E21b *9/20*

U.S. Cl. 175—248 **5 Claims**

Device for obtaining earth samples comprises an inner tube having cutting means at its forward end and adapted to be driven into the earth, fingers within the tube for detaching a core therewithin when the tube is pulled up, an outer casing frangibly attached to the inner tube, passageways between the tube and casing for receiving water

and, in a preferred embodiment, valve means for controlling the admission of water to said passageways adapted



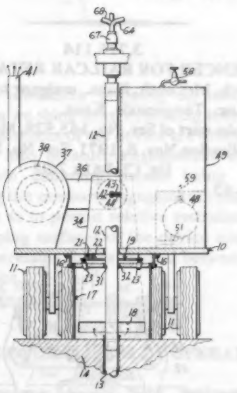
to be closed when said tube is withdrawn from the earth and broken loose from said outer casing.

3,716,108

APPARATUS FOR SETTLING DRILL DUST

James P. Loftis, Remlap; David L. Moody, and James H. Phillips, both of Oneonta, all of Ala., assignors to Robbins Machinery Company

Filed May 14, 1971, Ser. No. 143,325
Int. Cl. E21c 7/00
U.S. Cl. 175—205 **10 Claims**



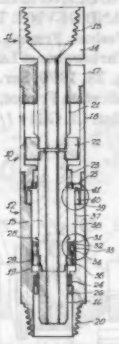
Dust settling apparatus having a first nozzle assembly discharging an atomized mixture of water and air under high pressure toward a hole being bored with the mixture moving in direction opposite direction of movement of dust from hole. A second nozzle assembly discharges an atomized mixture of water and air under high pressure into and in same direction as moving stream of dust after passing first nozzle assembly. Water supplied to nozzle assemblies from a small tank which communicates with lower end of a large tank. Air under high pressure introduced into small tank and air under low pressure introduced into large tank with small tank being exhausted to atmosphere at intervals permitting water to flow from large tank to small tank.

3,716,109

ROTARY JAR

William Earl Griffith, Okotoks, Alberta, Canada, assignor to Jarco Services Ltd., Calgary, Canada

Filed Feb. 22, 1971, Ser. No. 117,600
Int. Cl. E21b 1/10
U.S. Cl. 175—297 **10 Claims**



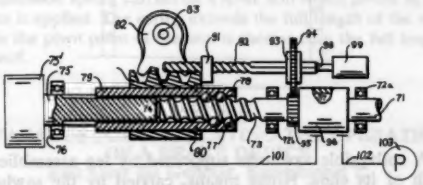
A rotary jar is disclosed for use in well bores when a tool, attached to the jar, becomes so stuck that normal tension on the drill string will not release it. The rotary jar has an outer housing and an inner mandrel with appropriate seals therebetween defining an annular working chamber. A knocker is attached to the mandrel and an anvil is attached to the housing. The working fluid in the working chamber exhibits low viscosity changes with high temperature changes. Within the chamber are located a piston and a valve combination so arranged that when the drill string is under high tension, fluid is forced in minute quantities through the valve combination. This is actually a mutual extension of the mandrel and housing which continues until the piston and valve combination come into contact with an annular sleeve in the chamber. The sleeve moves with the piston and valve combination allowing fluid to dump therebehind, thereby allowing the knocker and anvil to come into jarring contact. Provision is made for resetting the jar so that it may be operated continuously over over long periods of time.

3,716,110

STEERING AND DIRECTING MECHANISM

Albert G. Fonda, 481 Stacey Drive, King of Prussia, Pa.

Filed July 22, 1970, Ser. No. 57,120
Int. Cl. B62d 5/06
U.S. Cl. 180—79.2 R **30 Claims**



A power drive means of the motion augmentation type is provided by means of actuation of a reaction element of a kinematic machine coupling directing and dirigible members, to effect differential motions thereof in response to selected effects of directing motion. Means adaptable to rack-and-pinion steering and means adaptable to worm-and-pitman-arm

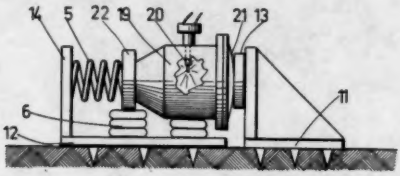
steering are disclosed. The approach is adaptable to either hydraulic or electrical actuation. Stability augmentation may also be provided from sensors of vehicle maneuvering, resulting in adaptive steering.

3,716,111

METHOD FOR INDUCING SHEAR WAVES IN THE EARTH AND DEVICE THEREFOR

Michel Lavergne, Le Vesinet, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants

Filed Aug. 28, 1970, Ser. No. 67,873
Claims priority, application France, Sept. 2, 1969, 6929979
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 EC 14 Claims



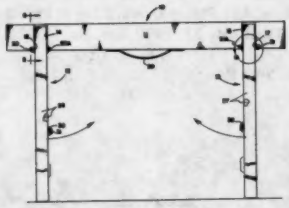
Method for inducing shear waves in the earth, comprising a generator producing two equal and opposed forces and means for transmitting said forces horizontally to vertical sections of the ground through the intermediary of springs of different rigidities, whereby said forces become unbalanced and the resultant force is transmitted horizontally to the ground.

3,716,112

COLLAPSIBLE SAWHORSE

Clarence R. Lake, 22705 SW. Lois St., Beaverton, Oreg. 97005

Filed May 19, 1971, Ser. No. 144,771
Int. Cl. F16m *11/00;* E04g *1/32*
U.S. Cl. 182—155 1 Claim



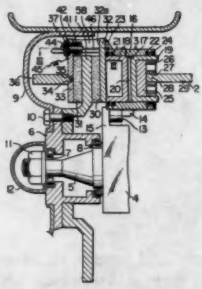
A collapsible sawhorse supported by leg assemblies at each of its ends. Hinge means, carried by the sawhorse main member, attaches the legs of each leg assembly and permits inward closing movement of the legs to a position perpendicular to and offset from the main member. Additional hinge structure permits simultaneous upward movement of the legs of each leg assembly into a position alongside said main member. Hinged leg movement occurs about two separate axes. Limit stop means retain the legs in place in a collapsed configuration.

3,716,113

WARNING DEVICE FOR INDICATING WEAR OF FRICTION PADS IN DISK BRAKE

Toyoaki Kobayashi, Naoji Sakakibara, and Toshio Kondo, Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed Oct. 30, 1970, Ser. No. 85,480
Claims priority, application Japan, Nov. 1, 1969, 44/57,450; June 25, 1970, 45/24,531, 45/24,533
Int. Cl. F16d *66/02*
U.S. Cl. 188—1 A 3 Claims



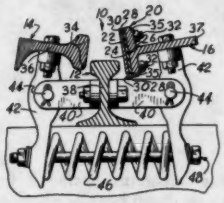
Each friction pad of a brake disk is provided with a detecting switch device operating to open a detection circuit when the pad is worn to an allowable wear limit thereby to cause a warning lamp to be lit. The detecting switch device may be a switch operated by movement of a backing metal supporting the friction pad, a wire cut by abrasion thereof by the brake disk, or contacts released by abrasion or contact by the brake disk, a spring device in each case preventing the detection circuit thus opened from being closed again.

3,716,114

SILENCER FOR RAILCAR RETARDERS

George W. Beck, McLouth, Kans., assignor to The Safety Skate Company, Inc., Tonganoxie, Kans.

Continuation-in-part of Ser. No. 143,528, May 14, 1971. This application Nov. 8, 1971, Ser. No. 196,665
Int. Cl. B61k *7/02*
U.S. Cl. 188—62 10 Claims



A silencing structure adapted to be used in conjunction with a railcar retarder of the kind which is composed of a pair of opposed, wheel-gripping, elongated jaws. The silencer is releasably attached to the jaw of the retarder that engages the inside face of the wheel and presents an elongated, wheel-engaging layer of frictionable, nonmetallic noise-suppressing material protected along each of its longitudinal edges by a

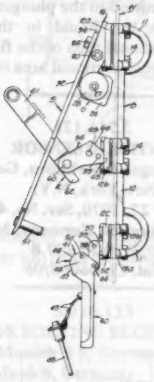
flange, the face of which is flush with the exposed surface of the layer. The flanges prevent unraveling of the edges of the material by protecting the layer from the scrubbing action of the rotating wheels thereby increasing the effective life of the silencer. The flanges also impart a substantial amount of the pressure exerted on the wheel, while at the same time, the layer serves to deaden or dampen the noise that is otherwise present when such metal-to-metal contact is made.

3,716,115

DEVICE FOR RELEASABLY GRIPPING AN ELONGATE FLEXIBLE MEMBER

Edwin C. Ebner, Kanosh, Utah, assignor to Max Fink; Floyd C. Hahn and Hugh W. Littlebury, Sr., Los Angeles County, Calif., part interest to each

Filed Nov. 27, 1970, Ser. No. 93,074
Int. Cl. B65h *59/61*
U.S. Cl. 188—65.1 **11 Claims**



A device for releasably gripping an elongate flexible member, such as a webbing strap extending therethrough, and wherein gripping surfaces of the device are resiliently urged by a loading spring into pressure engagement with the strap, manually operable camming means being provided for releasably varying the pressure engagement resulting from the loading spring, so as to permit relative restrained movements between the gripping surfaces of the device and the webbing strap under load stressing forces applied between the webbing strap and the device.

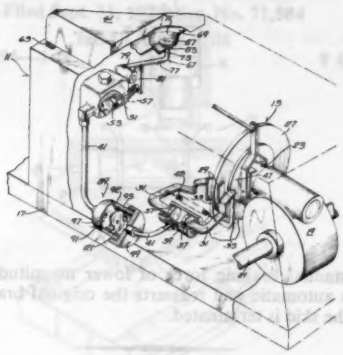
3,716,116

AUTOMATIC HYDRAULICALLY OPERATED SEAT BRAKE

Robert D. Von Seggern, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed March 2, 1971, Ser. No. 120,130
Int. Cl. B60t *7/02*
U.S. Cl. 188—109 **6 Claims**

Disclosed herein is a vehicle braking system including a brake shoe biased into braking engagement with a rotary member, and displaceable by hydraulic means from braking engagement with the rotary member, together with a pumping cylinder hydraulically communicating with said brake shoe displacing means cylinder and including a plunger operable to effect delivery of pressure fluid to said brake shoe displacing means, a seat movably mounted on said vehicle for movement relative to an in-use position, and a linkage engageable with said seat and engageable with said plunger to displace said plunger so as to deliver pressure fluid to said brake shoe displacing means and thereby to displace said brake shoe from braking engagement with the rotary member in response to movement of said seat to the in-use position, and further including means biasing said seat away from said in-use position, and means for controlling the rate of fluid flow between the pumping cylinder and the hydraulic brake shoe displacing means.

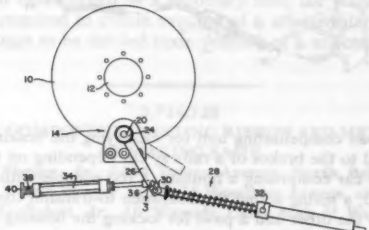


3,716,117

CONSTANT TORQUE SPRING APPLIED BRAKE

Carl E. Bricker, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Comapny, Akron, Ohio

Filed Aug. 21, 1970, Ser. No. 65,937
Int. Cl. B60t *13/04*
U.S. Cl. 188—167 **3 Claims**



The invention discloses a piston screw brake which is applied by a spring mechanism. The spring consists of a long compression spring carried on a lever arm which pivots as the brake is applied. The spring extends the full length of the arm while the pivot point of the arm is shorter than the full length thereof.

3,716,118

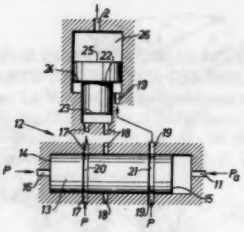
APPARATUS FOR REGULATING THE OPERATION OF A BRAKE DEVICE

Erik Olov Bo Gelhaar, Kungstorget 7, Lysekil, Sweden

Filed Nov. 19, 1970, Ser. No. 91,133
Claims priority, application Sweden, Nov. 19, 1969, 15,916/69
Int. Cl. B60t *8/02*
U.S. Cl. 188—181 T **6 Claims**

A hydraulic brake actuating and control system for wheeled vehicles is disclosed. The control system senses the frictional force generated by the braking system and regulates the hydraulic pressure whenever a skid condi-

tion is sensed. When skidding occurs, a predetermined portion of the hydraulic pressure is dumped to allow the wheels to rotate. The remaining pressure generates a substantial braking force of lower magnitude. The device is automatic and reasserts the original braking force after the skid is terminated.



3,716,119

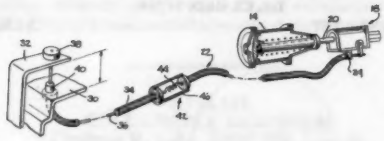
BRAKE MECHANISMS

Robert L. Ludington, 3419 Manitou Tr., and Robert M. Holloway, 921 North Roeske Trail, Pottawattomie Country Club Estates, both of Michigan City, Ind.

Continuation-in-part of Ser. No. 1,266, Jan. 7, 1970, Pat. No. 3,612,230. This application March 23, 1971, Ser. No. 127,277

Int. Cl. B60t *8/20*

U.S. Cl. 188—195 16 Claims



A load compensating unit for modifying the braking force applied to the brakes of a railway car depending on the load on the car comprising a housing, a rod slidable with respect thereto, a spring acting therebetween to transmit force from one to the other and a pawl for locking the housing and rod rigidly together under control of a cable actuated in accordance with the spacing between the car truck bolster and car frame and hence, with the car load. The load compensating unit is connected to and determines the amount of movement of a lever in the brake rigging upon application of the brakes and may be between the brake cylinder and the lever normally operated by the brake piston rod.

3,716,120

LIQUID PRESSURE LOCKING DEVICES FOR VARIABLE LENGTH STRUT MEMBERS

Kenneth Evered, and Eric Meredith, both of Leamington Spa, England, assignors to Automotive Products Company Limited, Leamington Spa, England

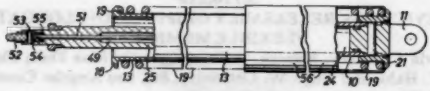
Filed Dec. 7, 1970, Ser. No. 97,464

Claims priority, application Great Britain, Dec. 8, 1969, 59,810/69

Int. Cl. F16f *9/16*

U.S. Cl. 188—300 4 Claims

A variable length strut member adapted particularly for use with aircraft seats and comprising an inner cylinder member and a plunger slidable within a bore in the inner cylinder member. The inner cylinder member is slidably engaged within an outer cylinder member so as to define a first chamber therebetween. A compression spring urges the two cylinder members apart so that the volume of the first chamber is increased. A second chamber is defined within the bore of the inner cylinder member and is bounded by the plunger. A non-return valve controls liquid flow between the two chambers, the valve comprising a ball spring loaded on a valve seat so as to prevent liquid flow between the two chambers and thus lock the strut member against change in length. The plunger carries a pin projection which is arranged to hold the ball off the valve seat to allow change of length of the strut member. The arrangement is such that the load of the compression spring is transmitted to the plunger component of the strut member through the liquid in the two chambers. Preferably the cross-sectional area of the first chamber is substantially equal to the cross-sectional area of the plunger.



3,716,121

ANTISKID SENSOR

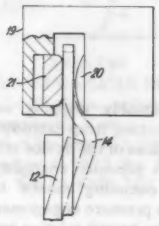
Heinz Frigger, 607 Langen-Oberlinden, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 27, 1970, Ser. No. 40,972

Claims priority, application Germany, May 29, 1969, P 19 27 235.6; May 29, 1969, P 19 27 237.8

Int. Cl. B60t *8/08*

U.S. Cl. 188—181 R 9 Claims



A sensor for vehicle antiskid systems, the sensor having a stationary reading head in direct contact with a rotating data carrier. The carrier may be a flexible edge mounted on the disc of a disc brake system or it may be a rigid carrier mounted on some other member rotating with the wheel such as the inside of the wheel hub. The data carrier has equally spaced variations in some characteristic to which the sensor responds such as magnetic spots, variable electrical resistance, or perforations which can be read by the sensing head.

3,716,122

LID LATCH FOR WASHING APPARATUS

Colin J. Baker; Raymond C. Preen, and Donald W. Wilson, all of Orange, New South Wales, Australia, assignors to Email Limited, Sidney, New South Wales, Australia

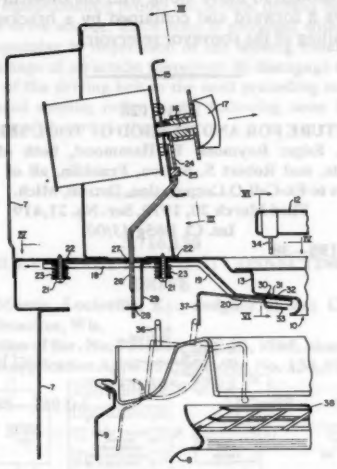
Filed March 19, 1971, Ser. No. 126,090

Int. Cl. H01h *35/02*; D06f *37/42*

U.S. Cl. 192—136 4 Claims

A mechanical linkage between the line switch generally included in the timer knob, and the interior of a centerpost

agitator washing machine which latches the door closed when the switch is moved to an on position and which moves the



switch to an off position when contacted due to excessive gyrations of the inner tub from an unbalanced condition.

3,716,123

APPARATUS FOR SORTING ELONGATED ARTICLES

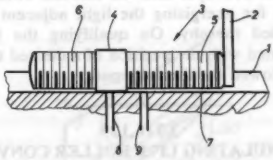
Rudolf Becker, 8 Munich 13, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Sept. 1, 1970, Ser. No. 68,668

Claims priority, application Germany, Sept. 3, 1969, P 19 44 675.4

Int. Cl. B65g *11/00*; B23q *7/12*

U.S. Cl. 193—40 4 Claims



Elongated articles, such as stud bolts, are conveyed in endwise relationship along a chute to a point of use. A fixed stop is engageable by articles within the chute. A pair of spaced airjet detectors are longitudinally spaced in the bottom of the chute and positioned at predetermined distances from each other and from the stop. When an article engages the stop, at least one or none of the airjet detectors will be covered depending on the position of the article in the chute. The detectors are connected to a pneumatic signal circuit which generates signals in response to the position of an article with respect to the said detectors.

3,716,124

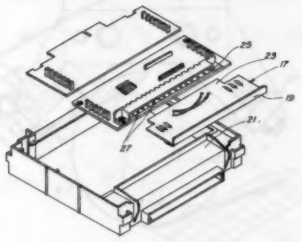
VENDING MACHINE PRICING CONTROL ARRANGEMENT

Casimer J. Dabrowski, Mount Prospect, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,584

Int. Cl. G01f *9/08*

U.S. Cl. 194—1 N 8 Claims



A series of pricing boards have circuit connections formed thereon to provide a variety of different pricing combinations based upon the monetary system of the country in which they are to be used and the prices of various vend items. A pricing board having the desired pricing combination is inserted into an appropriate opening in a vending machine, where it is secured to complete appropriate circuits to the pricing apparatus and the vend control mechanism of the vending machine. Controls that may be provided by a pricing board are the amount of credit to be accorded to a monetary unit, the number of credits required to obtain vending of a selected item, and the amount to be debited upon vending of a selected vend item.

3,716,125

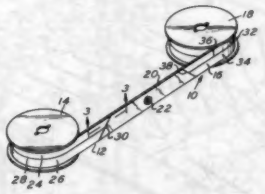
THREE COMPONENT PRINTING RIBBON AND METHOD OF MAKING SAME

Walter Ploeger, Jr., 1404 Dewey Avenue, North Bellmore, N.Y.; Walter Ploeger, Sr., 3675 Woodbine Avenue, and William Godigkeit, Jr., 19 Wayside Lane, both of Wantagh, N.Y.

Filed July 22, 1970, Ser. No. 57,208

Int. Cl. B41j *31/02*

U.S. Cl. 197—172 4 Claims

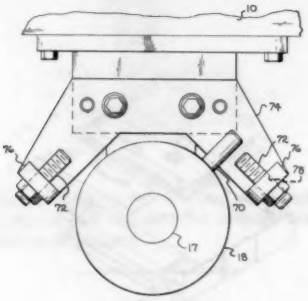


A printing ribbon has two differently constructed portions interconnected by an uninked connector strip welded to the ends of said portions to form a three component ribbon.

3,716,126
NINETY DEGREE SWEEPOUT WITH AUTOMATIC PHASING CONTROL

Jack I. Perry, and Bernard A. Schmader, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed May 28, 1971, Ser. No. 147,847
Int. Cl. B65g 47/00
U.S. Cl. 198—24 8 Claims

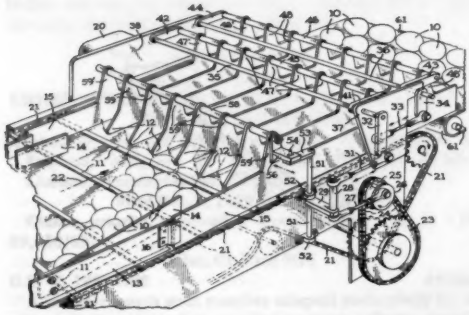


Apparatus and method for moving newly formed glass containers from a glass forming machine dead plate to a removal conveyor with automatic control means for the phasing of a sweep arm. Apparatus and method for automatically resetting the sweep arm of a 90° container sweepout mechanism associated with a glass forming machine is set forth and becomes operative when the sweep arm has been prevented from completing its cycle, due to an obstruction in its sweep path. In the present invention, positive stop provisions are integrated with the driven member to insure that the sweeping means cannot overtravel its normal operational limits in the event that a detent pin is slipped out of positive engagement with the driving member. In one embodiment for new mechanisms, the stop provisions are located internally of the housing carrying the main drive shaft. In an alternative embodiment, designed for utilization with existing mechanisms, the stop provisions are bolted onto the sweepout mechanism externally of the rest of the mechanism.

3,716,127
COMPOUND MOTION EGG CHANNELING DEVICE

Thomas V. Loeffler, Northville, Mich., assignor to Diamond International Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,415
Int. Cl. B65g 47/26
U.S. Cl. 198—30 9 Claims

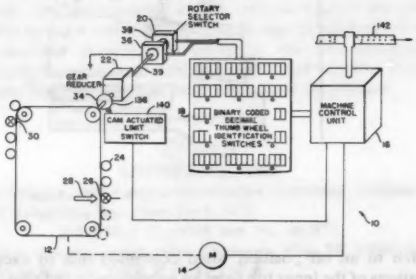


An egg channeling device for aligning eggs passing therethrough from a reservoir into an arrangement in rows, having flexible dividers which are moved by levers and connecting rods in both a vertical and a transverse direction thereby causing a compound movement in a sideward-upward direction of the plurality of dividers. End wall dividers on opposite sides of the conveyor are flexible enough to move along with the other dividers and still have a forward end contained by a bracket attached to the railing of the conveyor reservoir.

3,716,128
STRUCTURE FOR AND METHOD OF TOOL SELECTION

Dick O. Edge; Raymond F. Hammond, both of Madison Heights, and Robert S. Sutton, Franklin, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed March 20, 1970, Ser. No. 21,419
Int. Cl. B65g 43/00
U.S. Cl. 198—38 11 Claims

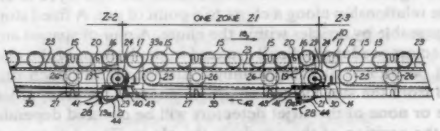


Tools having a code number are placed in individual tool positions on an endless conveyor from which they are to be selected. A separate identification switch associated with each tool position on the conveyor is set with a coded number representing the tool in the associated tool position on the conveyor. As the conveyor is moved, selector switch means are closed in accordance with the movement of the conveyor to sequentially qualify identification switches associated with particular tool positions on the conveyor. A light is provided adjacent each identification switch associated with each tool position on the conveyor and the selector switch means includes means for energizing the light adjacent the selector switch qualified thereby. On qualifying the identification switch associated with the position of a desired tool, the conveyor is first slowed and then stopped.

3,716,129
ACCUMULATING LIVE ROLLER CONVEYOR

Albert Corneil Sadler, Jr., 147 Lazard, Mount Royal, Quebec, Canada

Filed April 22, 1971, Ser. No. 136,516
Int. Cl. B65g 13/02
U.S. Cl. 198—127 14 Claims



Several groups of transport rollers and a depressible sensing roller (between every two adjacent groups) of transport rol-

lers constitute an article supporting bed of the conveyor, which bed is divided into a plurality of successive zones each containing one group of transport rollers and one sensing roller. A plurality of driving belts constantly engage the group of transport rollers in the respective zones, and separate driving means independently propel the several driving belts from a common drive source. Each zone is provided with control means, responsive to depression of the sensing roller in that zone by passage of an article thereover, to disengage the driving means of the driving belt in the next preceding zone until the depressed sensing roller in the following zone is raised after passage of the article thereover.

3,716,130

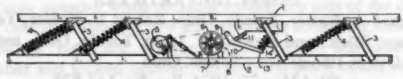
VARIABLE VOLTAGE RESILIENT CONNECTING ROD DRIVE

John M. Morris, Louisville, Ky., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Continuation of Ser. No. 786,286, Dec. 23, 1968, abandoned. This application April 15, 1971, Ser. No. 134,497

Int. Cl. B65g *27/18*

U.S. Cl. 198—220 DA **7 Claims**



A vibratory conveyor trough supported on resilient means to form a vibratory system having a resonant frequency is driven by an eccentric shaft and connecting rod resiliently coupled to the conveyor trough. The eccentric shaft, which may be fitted with a flywheel, is driven by a squirrel cage induction motor the speed of which is varied by adjustment of the voltage applied to the motor.

3,716,131

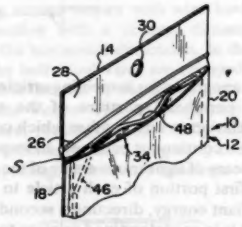
ENVELOPE-TYPE PACKAGE FOR FOLD-OVER TYPE COFFEE FILTER SHEETS

Irving Ackerman, 9226 North Kolmar Ave., Skokie, Ill.

Filed Nov. 5, 1971, Ser. No. 196,073

Int. Cl. B65d *85/04*

U.S. Cl. 206—57 **3 Claims**



A commercial envelope-type package including a quantity of once-folded coffee filter sheets of the rectangular fold-over type, the transverse width of the envelope of the package being slightly less than the transverse width of the once-folded sheets, thus creating a bulge which opens up the centerfolds of the sheets for reception of the user's forefinger thereinto and facilitates sliding of a single filter sheet from the package. A corner relief area of the folded sheets is provided in order further to facilitate proper selection of a single sheet for withdrawal purposes.

3,716,132

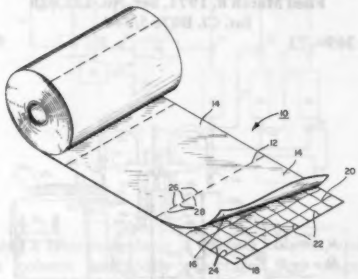
THREAD-REINFORCED LAMINATED STRUCTURE HAVING LINES OF WEAKNESS AND METHOD AND APPARATUS FOR CREATING LINES OF WEAKNESS

Roman Lewyckyj, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.

Filed Nov. 20, 1970, Ser. No. 91,240

Int. Cl. B32b *5/02*

U.S. Cl. 206—58 **23 Claims**



A laminated structure comprising at least one ply of cellulosic wadding with reinforcing threads secured thereto has a plurality of spaced lines of perforations separating discrete sheets of the laminated structure. Each line of perforations is defined by a series of spaced, discrete cuts spaced apart by uncut regions. The tensile strength of segments of reinforcing threads disposed in the uncut regions is substantially lower than the tensile strength of segments of reinforcing threads disposed outside of the uncut regions to thereby define lines of weakness along the lines of perforations. Method and apparatus for creating the above-described lines of weakness in the laminated structure by applying a crushing force in at least uncut regions to substantially weaken the segments of reinforcing threads disposed in the uncut regions.

3,716,133

PACKAGE FOR FRANGIBLE ARTICLES

William F. Koebler, and Dale A. Frank, both of Charles City, Iowa, assignors to Salsbury Laboratories, Charles City, Iowa

Filed Feb. 10, 1971, Ser. No. 114,263

Int. Cl. B65d *71/00*

U.S. Cl. 206—65 A **5 Claims**

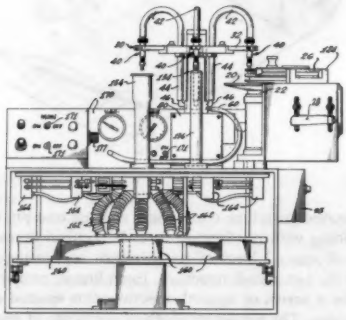
A package for containing and storing a plurality of frangible articles carried on elongated racks or wands. A film of trans-

parent heat-shrinkable material is heat-shrunk about the elongated wands. Openings in the wrapping material are provided near each end of the package, and printed information readable through the wrapping material is enclosed on a label.

3,716,134
APPARATUS FOR AUTOMATICALLY TESTING AND SORTING ELECTRICAL ELEMENTS

Robert D. Campbell, La Crescenta, Calif., assignor to San Fernando Electric Manufacturing Co., San Fernando, Calif.

Filed March 8, 1971, Ser. No. 122,028
Int. Cl. B07c 5/344
U.S. Cl. 209—73 **9 Claims**



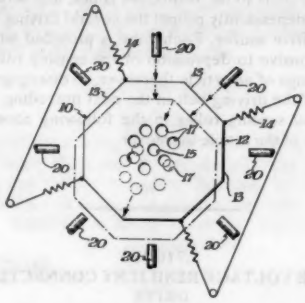
Electrical elements are moved by vibrator apparatus to a position below a multi-arm having a plurality of circumferentially spaced pickups to which respective tubes are connected. The spider is on a post that is moved in steps, and at the end of each step is raised and lowered. Via a control element around which the spider moves, each pickup tube is connected to a vacuum source as it reaches a pickup station, so that it captures a single element, and is maintained on vacuum through a test station to a drop station, where the vacuum is cut off and the element is released and directed to a receptacle selected as a result of a measurement previously made at the test station. Test contact arrangements shown include spaced spring contacts on nonconductive discs releasably mounted on a post, and spaced contacts wherein one is mounted on such a disc and the other is on the pickup. For the latter, connection to a stationary terminal is effected through a respective wiper for each contact carried by the spider structure. Also shown is photoelectric detection and associated air blast apparatus for returning components to the vibrator which do not have predetermined light reflective surfaces facing upward.

3,716,135
SORTING DEVICE

Noel C. Sears, Becket, and Roland G. Remillard, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sept. 16, 1970, Ser. No. 72,713
Int. Cl. B07c 3/02
U.S. Cl. 209—74 **7 Claims**

Sorting apparatus for individual elements comprising an aperture and a shiftable body having a plurality of separate chutes each associated with a respective receptacle. The elements are passed individually through the aperture and are received in one of the chutes of the shiftable body which chute delivers the element to the respective receptacle. This delivery through the chute takes place while the shiftable member may be undergoing repositioning. While one element is in the process of being delivered to a predetermined receptacle, the

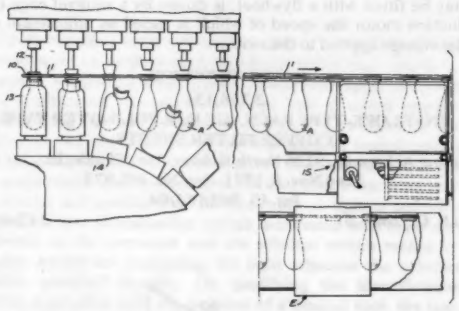


procedure may be underway for receiving the next succeeding element and passing the next element to a different predetermined receptacle.

3,716,136
INSPECTING ARTICLES

Richard A. Birner, Toledo, Ohio, Robert D. Kohler, Temperance, Mich., and Stewart M. Lang, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 28, 1971, Ser. No. 147,838
Int. Cl. B07c 5/342
U.S. Cl. 209—82 **11 Claims**



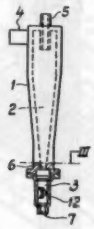
A method and apparatus for inspecting articles to determine whether or not peripheral portions of the articles are in predetermined relation to one another which comprises moving the articles in a continuous path past an inspection station, directing a first beam of light transversely of the path of the article, causing a first portion of each article to intercept said first beam of radiant energy, directing a second beam of radiant energy which is in predetermined relation to the first beam and is adapted to have one part thereof intercepted by a second portion of the article and another part thereof pass the article if the second portion of the article is in predetermined relation to the first portion and creating a signal for reject or recording when the second beam is intercepted in its entirety or passes without intercepting the article. The method and apparatus further comprises utilizing a plurality of beams at different preselected longitudinally spaced areas of the article to determine other positions of various portions on the periphery of the article with respect to one another at each cross-section.

3,716,137

CYCLONE SEPARATOR

Rune Helmer Frykhult, Johanneshov, Sweden, assignor to Aktiebolaget Celleco, Tumbra, Sweden

Filed March 18, 1970, Ser. No. 20,539
Claims priority, application Sweden, March 21, 1969, 3959/69
Int. Cl. B04c 5/14
U.S. Cl. 209—211 3 Claims



From the vortex chamber of a cyclone separator, a separated phase enters a discharge chamber coaxial with the vortex chamber and through which this phase flows toward a discharge opening while rotating around the axis of the chambers, thus following a screw-shaped track. Retarding means of the screw type are arranged coaxially in the discharge chamber and locked against rotation, the pitch of the retarding means being reversed relative to the pitch of the screw-shaped track of the separated phase.

3,716,138

SCREEN

Alexander D. Lumsden, Lancaster, Pa., assignor to Hoyt Wire Cloth Company, Lancaster, Pa.

Filed May 13, 1970, Ser. No. 36,974
Int. Cl. B07b 1/46
U.S. Cl. 209—401 8 Claims

A vibrating screen woven with wire having an elliptic or oval cross section with a vertical dimension substantially greater than the horizontal dimension. In the manufacture of the screen, the individual wires are crimped prior to weaving so as to control the size of the openings provided by the interstices of the weave. The openings may have an outline which is square, rectangular (normally called oblong), or a combination (normally called long-slot) combining elongated rectangular openings with square openings.

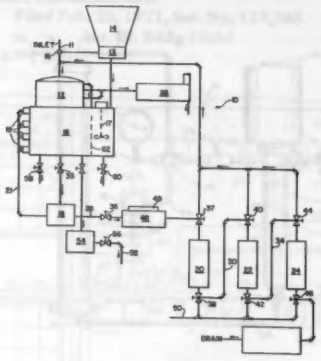
3,716,139

WASTE TREATMENT SYSTEM

Abner B. Turner, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1970, Ser. No. 80,985
Int. Cl. B01d 29/38, 15/06
U.S. Cl. 210—104 8 Claims

A solids separation device consisting of a conveyor belt composed of tightly coiled springs, a dry chemical feed system, a surge conditioning tank of minimum size, an incinerator and a maximum flow filtration-absorption system



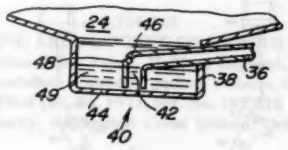
comprising a filter-coagulator, a stripper column, and an absorption column compactly structured for usage under minimum available space conditions.

3,716,140

COOKING FAT FILTER WITH FAST START-UP

Richard T. Keating, 4301 West Madison Street, Chicago, Ill.

Filed April 2, 1971, Ser. No. 130,579
Int. Cl. B01d 35/00
U.S. Cl. 210—167 3 Claims



A cooking fat filter constructed with the upper edge of the fat vessel low relative to the floor so that it may be used in conjunction with fat fryers having a gravity drain, said vessel having a shallow sump subtended therefrom, there being a suction tube opening in and adjacent the bottom of the sump, said suction tube being inclined downwardly to the sump from a pump inlet and said tube having a by-pass hole opening to the sump above the level of all melted fat back-drained to the sump from pump-fryer return conduit system following filter shut-down, said hole bypassing hot liquid fat from the vessel to the suction tube during start-up and quickly melting solidified drainage fat stopped up therein, thereby dispensing with the time-consuming need to clean or drain the fat flow system after filter shut-down.

3,716,141

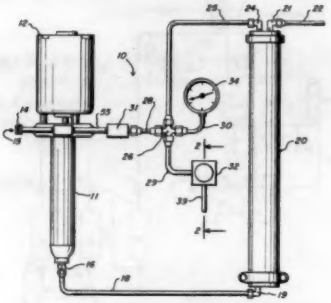
SOLVENT SEPARATING APPARATUS

Donald Dean Spatz, Minnetonka, Minn., assignor to Osmonics, Inc., Minneapolis, Minn.

Filed Feb. 1, 1971, Ser. No. 111,189
Int. Cl. B01d 31/00
U.S. Cl. 210—194 10 Claims

A solvent separating apparatus for purifying a solution by exposing said solution, under pressure, to a solvent separating means including a non-positive displacement pump for elevating the pressure of said solution prior to direction into said sol-

vent separating means and means including two presized orifices for maintaining the desired pressure and desired flow rate of said solution through said solvent separating means and



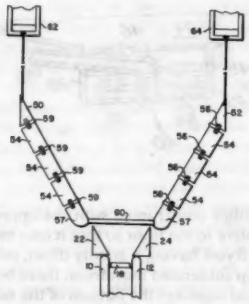
for flushing said solvent separating means periodically without the necessity of further adjustments in order to return the system to normal operating conditions.

3,716,142

LIQUID SURFACE SWEEPING APPARATUS

Ralph A. Bianchi, Lexington, Mass., assignor to JBF Scientific Corporation, Burlington, Mass.

Filed June 14, 1971, Ser. No. 152,662
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **11 Claims**



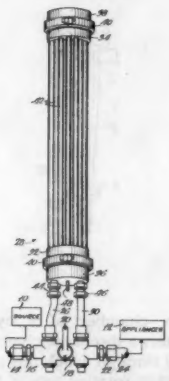
Buoyant sweeping members for use with a craft designed to skim floating materials, such as oil or oil-soaked sorbents from the surface of a body of water are described. These members are of two general types. The first is roughly triangular in shape when floating in the water and viewed from above. It has one planar edge surface and the underbody is curved both laterally away from this planar edge and also longitudinally. To form a sweep, two of these members are located with their planar surfaces opposing each other and converging in the direction of water flow. The points of the triangular shape point upstream and the members are articulated about a generally horizontal axis. A second member, used in conjunction with the first is generally rectangular in shape with a single planar edge surface. This member is laterally curved from the lower edge of the planar surface upwardly to the outer edge of the member. It is joined with members of the type described to form elongated booms for concentrating floating materials to then be skimmed from the water surface.

3,716,143

REVERSE OSMOSIS SEPARATION APPARATUS

George B. Clark, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed March 30, 1970, Ser. No. 23,687
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **13 Claims**



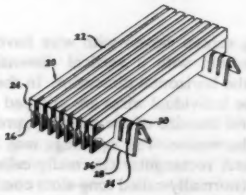
A reverse osmosis liquid purification unit particularly adapted for home use in conjunction with low pressure water systems. The unit is adapted to receive water from a low pressure source to provide pure water that would otherwise be unobtainable for such purposes as drinking and direct all unpurified water to appliances within the home utilizing water without wastage.

3,716,144

SCREEN HAVING PARALLEL SLOTS AND METHOD

Aulden H. Bartlow, Carbondale, Pa., assignor to Hendrick Manufacturing Company, Carbondale, Pa.

Filed March 9, 1971, Ser. No. 122,441
Int. Cl. B01d *39/10*
U.S. Cl. 210—499 **7 Claims**



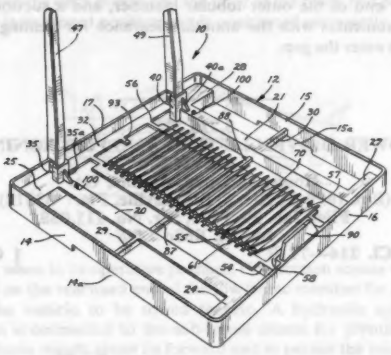
A screen having parallel slots therethrough comprises a plurality of rods supported in spaced parallel relation by transversely extending support members. The support members comprise spaced side walls having upper edges upon which the rods rest and bridges extending upwardly and between the rods to connect the side walls as one piece. The rods are anchored to the support members by swaging the rods at points below the elevation of said bridges in a fashion that displaces material in the rods to positions underlying said bridges, thus creating an interference lock between the rods and the bridges.

3,716,145

RECORD HOLDING STRUCTURE

Julian Gutierrez, 6233 Brookview Ave., Minneapolis, Minn.

Filed April 29, 1971, Ser. No. 138,712
Int. Cl. A47b 81/06
U.S. Cl. 211—40 8 Claims



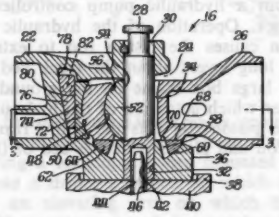
A phonograph record holding apparatus comprising a multiplicity of pivotal record holding members each arranged and adapted to have lateral displacement for their insertion and removal. Said members each comprise a yoke portion to receive a record and have shaft portions extending from either end thereof journaled in aligned apertures of a pair of spaced supporting members with one of said supporting members including a stop member to engage and abut one shaft end of a holding member to retain said holding member in operating position, said stop member being adapted to yield to an upward bias to free said shaft end and permit lateral displacement or movement of said holding member for removal thereof from said supporting members.

3,716,146

SLACK ADJUSTER FOR RAILWAY CAR COUPLERS

Russell George Altherr, Munster, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 17,257, March 6, 1970, abandoned. This application Aug. 26, 1971, Ser. No. 175,107
Int. Cl. B61g 1/28
U.S. Cl. 213—75 R 6 Claims



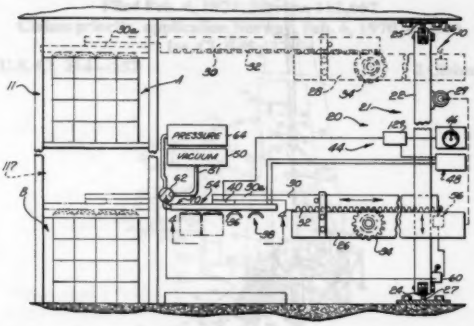
A gravity-feed wedge shaped shim disposed within the coupler, is utilized as a slack adjuster in conjunction with positioning means to establish the desired minimum clearance between abutting parts to substantially compensate for slack along the longitudinal axis of the coupler.

3,716,147

STACKER CRANE ORDER PICKER

George R. Pipes, South Euclid, Ohio, assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,365
Int. Cl. B65g 59/04
U.S. Cl. 214—1 BT 7 Claims



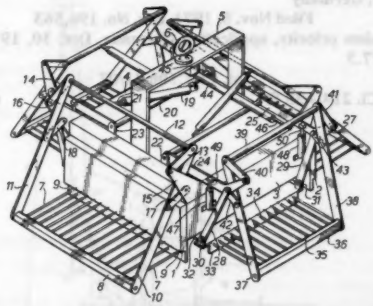
An article-handling apparatus removes a predetermined number of articles from a matrix of articles. The article-handling apparatus includes an article-engaging means which is movable to an article pickup position at which the article engaging means picks up articles. The article-handling apparatus also includes sensing means which is associated with the article pickup means and operates to sense the number of articles supported by the article-pickup means. The sensing means controls a means which is operable to control the number of articles picked up by the article pickup means.

3,716,148

SPLITTING AND BLENDING OF FIBROUS BALES

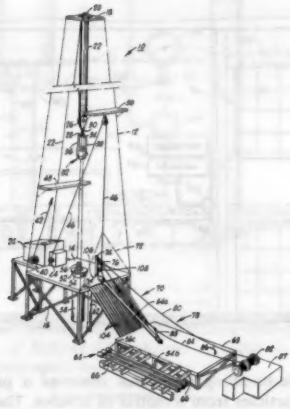
John Maximilian Jules Varga, Halifax, England, assignor to Carding Specialists (Canada) Limited, Ontario, Canada

Filed Oct. 26, 1971, Ser. No. 192,218
Claims priority, application Great Britain, Oct. 23, 1970, 50,447/70
Int. Cl. B65g 59/02
U.S. Cl. 214—8.5 C 8 Claims



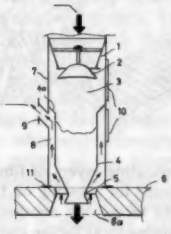
Apparatus for separating layers of fibrous material from a bale, comprising means for pressing on the top of the bale, a pair of splitting forks facing one another in a first horizontal plane, a pair of retaining forks facing one another in a slightly lower horizontal plane and at right angles to the first pair of forks, means for forcing the two pairs of forks into a bale from four directions, and means for lifting the pressing means and splitting forks relative to the retaining forks to separate a layer from the bale, the remainder of which is retained by the retaining forks.

3,716,149
APPARATUS FOR PIPE HANDLING
Orville C. Scaggs, 918 West Choctan, Lindsay, Okla.
Filed Nov. 3, 1971, Ser. No. 195,187
Int. Cl. E21b *19/14*
U.S. Cl. 214—2.5 **9 Claims**



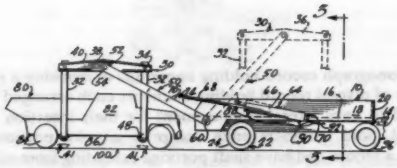
Apparatus for handling oil field pipe and casing in accelerated manner and which reduces likelihood of damage to bell housing or threaded ends of pipe sections during the handling process. The apparatus consists of an endless trolley rigging secured to operate through the V-doors of the derrick assembly in coaction with the pipe racks and pipe handling area, as well as a tensioning tool and hoist line which, in turn, function interactively with the trolley cable to deliver pipe sections at the V-door at proper manipulation level while avoiding contact of the more fragile pipe ends with damaging surfaces; this procedure serves to reduce greatly loss and damage to highly expensive pipe sections.

3,716,150
DEVICE FOR CHARGING COKING OVENS
Heinrich Echterhoff, and Wilfried Herz, both of Essen, Germany, assignors to Firma Bergwerksverband G.m.b.H., Essen, Germany
Filed Nov. 8, 1971, Ser. No. 196,563
Claims priority, application Germany, Dec. 10, 1970, P 20 60 677.3
Int. Cl. C10b *31/02*
U.S. Cl. 214—35 R **6 Claims**



An outer tubular member has a lower end which is to be placed into communication with the inlet opening of the coking oven, and an upper end which communicates via a normally open back-pressure valve with a coal hopper. The valve closes if back-pressure of a certain magnitude develops in the inlet of the coking oven. An inner tubular member is concentrically accommodated in the outer tubular member and has at its upper end a flange which is connected with the inner side of the outer tubular member so that the members define between themselves an annular gap which is open at the lower end of the outer tubular member. A lower end portion of the inner tubular member converges conically outwardly beyond the lower end of the outer tubular member, and a suction vent communicates with the annular clearance for venting gases which enter the gap.

3,716,151
POWER DRIVEN LIFTING AND POSITIONING DEVICE
Homer C. Dodd, Atlanta, Ga.
(Box 1099–F, Rte. 6, Brooksville, Fla. 33512)
Filed Jan. 29, 1971, Ser. No. 111,038
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 R **1 Claim**

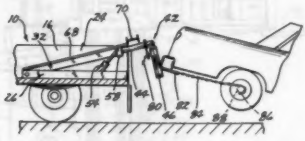


Especially suited for lifting vehicles such as automobiles and small trucks to load same on the back of another, larger vehicle such as a tractor trailer truck, a box-like lifting frame comprising a vertical, steel channel post at each of the four corners is structurally rigid by means of transverse steel rod members and a pair of longitudinal frame members across the tops of respective pairs of corner posts. Lifting supports across the bottom of the frame are constructed from metal tread plate attached by steel rods. The bottom of the box-like frame is of a size to correspond with and fit into the bed of a transport truck. Large, long lifting levers made from steel channel have one end pivotally attached to the sides of the truck bed on each of the two sides and the other end is attached substantially medially by a pivot pin to the top channels. A hydraulic cylinder on each side of the truck bed has one end pivotally attached to the truck bed and the end of the extensive cylinder rod therein pivotally attached at a point less than half the distance of the long lever. Suitable hydraulic control means is provided to be operated from a hydraulic pump controlled from the transport truck. Operation of the hydraulic cylinder in one direction causes the piston rod to extend thereby pivoting the long levers about the truck bed pivot point to place the large box frame on the ground or beneath a vehicle after which actuation of the hydraulic cylinders to return the piston rod lifts the entire frame with the vehicle thereon and places it on the bed of the truck.

3,716,152
VEHICLE TOWING MEANS
James W. Sloter, 514 E. Chubb, Algona, Iowa
Filed April 30, 1971, Ser. No. 139,086
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **6 Claims**

A means for towing a vehicle comprising a frame means which is positioned on the floor of a truck bed with a sub-

frame means being pivotally connected at its forward end to the forward end of the frame means. A normally horizontally disposed deck means is secured to the sub-frame means and extends thereover and the frame means and is spaced above the floor of the truck bed. The sub-frame means includes a tow frame member which is selectively movably mounted on the sub-frame means between stored and operative positions. The rearward end of the tow frame member is received between the deck means and the floor of the truck bed portion when in its stored position and is positioned rearwardly of the



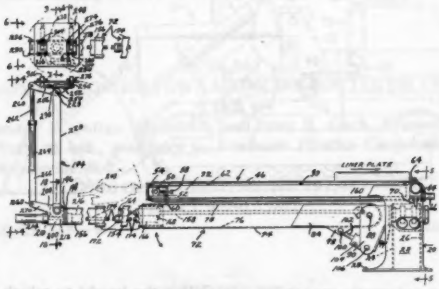
truck when in its operative position. Connection means is provided on the rearward end of the tow frame member for securing the vehicle to be towed thereto. A hydraulic cylinder means is connected to the sub-frame means for pivoting the sub-frame means about its forward end to permit the rearward end of the tow frame member to be selectively raised and lowered to raise and lower one end of the vehicle to be towed. A closure means closes the rearward end of the frame means when the tow frame member is in its stored position so that the bed portion of the vehicle may be used for other purposes when a vehicle is not being towed.

3,716,153

DEVICE FOR POSITIONING LINER PLATES UPON THE INTERIOR SURFACE OF A DRUM FOR SECUREMENT THERETO

Maurice J. Bartell, Duluth, Minn., assignor to Barko Hydraulics, Inc., Duluth, Minn.

Filed Oct. 20, 1971, Ser. No. 190,970
Int. Cl. B66b *17/00*
U.S. Cl. 214—91 **19 Claims**



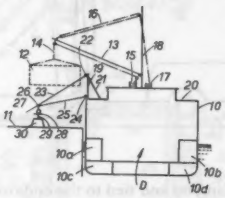
A device for positioning liner plates upon the interior surface of a drum for securement thereto which includes a support having a telescopic boom mounted thereon for extension into a drum, a platen on which is secured a liner plate, an elevating arm on which the platen is mounted with a gear and rack for moving the elevating arm, gear and rack means for rotating the boom on its longitudinal axis together with a hydraulic ram for pivoting the boom on the support, a ram for tilting the platen relative to the elevating arm, the platen being rotatable on the elevating arm with a hydraulic ram for rotating the platen and an endless belt mounted on the support for conveying a liner plate to the platen.

3,716,154

PROCESS OF COUNTERACTING A TILTING OF A SHIP'S HULL DURING LOADING AND UNLOADING OF COMPARATIVELY HEAVY CARGO UNITS AND A DEVICE TO BE USED IN SUCH PROCESS

Leif Berg, Risskov, Denmark, and Ragnar Jonas Nes, Minde, Norway, assignors to Ingeniorene Lund, Mohr & Glaever-Euger, Bergen, Norway

Filed Feb. 4, 1971, Ser. No. 112,667
Claims priority, application Norway, Feb. 6, 1970, 414/70
Int. Cl. B65g *27/04*
U.S. Cl. 214—152 **2 Claims**



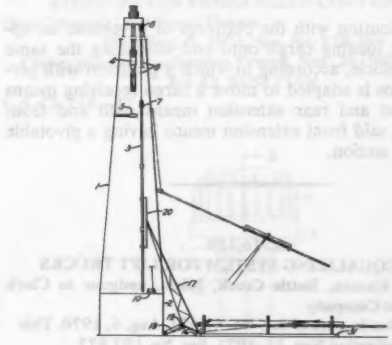
A process to prevent tilting of a ship's hull during loading and unloading of comparatively heavy cargo units by means of the ship's own cargo gear, using at least one supporting leg mechanism on board the ship to support the ship against a top face on a quay and using a manometer in said mechanism to control that a positive load is applied continuously in said mechanism against said top face provided mainly by trimming the ballast tanks of the ship. A supporting leg mechanism provided with a manometer and means to adjust the mechanism in relation to the quay level.

3,716,155

METHOD OF HANDLING DRILL PIPE

Homer J. Woolslayer; Joseph R. Woolslayer; Cecil Jenkins, all of Tulsa, and Erwin A. Campbell, Bixby, all of Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Division of Ser. No. 25,644, April 6, 1970, Pat. No. 3,613,905.
This application July 12, 1971, Ser. No. 161,658
Int. Cl. E21b *19/14*
U.S. Cl. 214—152 **5 Claims**



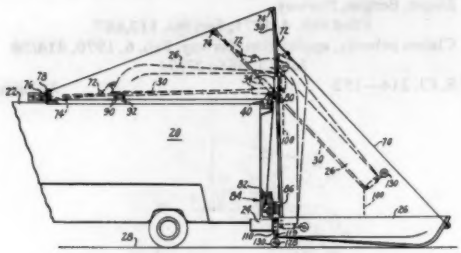
As each successive stand of drill pipe is pulled out of a well hole at the bottom of an oil well derrick, it is set back in the derrick until a multiple stand set back has been formed. Then the lower end of the setback is swung out of the derrick and away from it while the upper end of the setback is being lowered. Substantially at the same time the setback is moved bodily, lower end first, away from the derrick to lay the setback down on a support.

3,716,156

BOAT TRANSPORTER

Donald R. Risney, 2028 Richmond St., Sacramento, Calif.

Filed March 30, 1971, Ser. No. 129,335
Int. Cl. B60r 9/00
U.S. Cl. 214—450 4 Claims



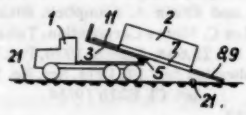
A cross piece clamped and tied to the ends of a boat, rotatable about the short axis thereof, and longitudinally movable about the long axis thereof for lifting the boat onto the roof of a vehicle. A pin-tube assembly for removably and controllably positioning wheels to the rear of a boat.

3,716,157

APPARATUS FOR LOADING OF CARGO ONTO AND UNLOADING CARGO FROM A VEHICLE

Johannes Mittler, Rheinhausen, and Karl Schardey, Rumeln-Kaldenhausen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 1, 1971, Ser. No. 185,775
Claims priority, application Germany, Oct. 10, 1970, P 20 49 875.3
Int. Cl. B60p 1/28
U.S. Cl. 214—505 11 Claims



In combination with the platform of a vehicle, an apparatus for loading cargo onto and unloading the same from the vehicle, according to which a platform with pivotable means is adapted to move a cargo receiving means having front and rear extension means onto and from the vehicle, said front extension means having a pivotable supporting section.

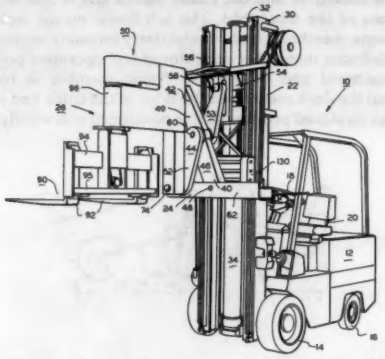
3,716,158

LOAD EQUALIZING SYSTEM FOR LIFT TRUCKS

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company

Continuation-in-part of Ser. No. 61,672, Aug. 6, 1970. This application Nov. 11, 1971, Ser. No. 197,822
Int. Cl. B66f 9/14
U.S. Cl. 214—730 11 Claims

A load equalizing and stabilizing system for use with lift trucks having an upright and an attachment for handling laterally positioned loads, in which a pair of laterally spaced, vertically positioned racks are mounted on the upright on opposite sides of the center line thereof, and one or more horizontally positioned shafts extends between said racks and are journalled in the carriage and contain pinions mounted on the end thereof meshing with the racks. The pinions are mounted on the ends of the shaft in such a manner that they



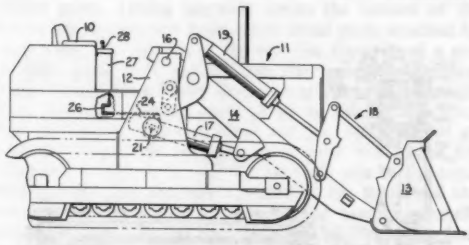
can tilt laterally to adjust to irregularities in the racks, this being preferably accomplished by a crowned spline structure interconnecting the shaft and pinion.

3,716,159

AUTOMATIC VALVE CONTROL MECHANISM FOR VEHICLE MOUNTED IMPLEMENTS

Stamos I. Papasideris, Bristol, and Robert A. Shiffler, West Chicago, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 17, 1971, Ser. No. 116,114
Int. Cl. B66f 9/00
U.S. Cl. 214—762 8 Claims



An automatic means for controlling the height to which a loader bucket is raised comprising a valve control mechanism supported by pivotal means adapted to be controlled by a hydraulic jack which, in turn, employs a detented control valve by which the jack is operated and means to disengage the detent to allow the valve to return to a neutral position when the implement reaches a predetermined, raised position. The latter means includes a valve-actuating lever connected to the valve by a mechanical linkage, a control link assembly having a spring-loaded, lost-motion link means as an integral part thereof, and lever means actuating the control link assembly by the pivotal movement of the jack. The lost-motion link means is operable upon adjusting the implement to a predetermined position to forcibly move the actuating lever to disengage the detent means allowing the valve to return to its neutral position.

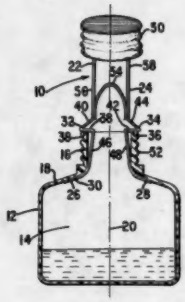
ERRATUM

For Class 214—768 see:
Patent No. 3,716,175

3,716,160
SAFETY CLOSURE DEVICE

Douglas W. Thomas, Toms River, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,631
Int. Cl. B65d *39/12*
U.S. Cl. 215—9 5 Claims

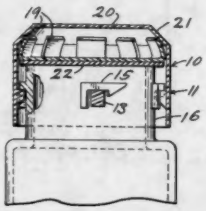


The disclosure is directed to a safety closure device for liquid containers which prevent a child from placing his mouth in contact with the discharge neck of the container but permit the contents to be poured freely. The device is comprised of a number of legs which may be connected to the cap and extend down into the bottle in the closed position. In the open position feet or lower members of the legs engage the inner surface of the neck at the bottom and lugs engage the upper surface of the neck preventing the cap from being withdrawn or pushed back into the bottle until a compression force is applied to the legs. The cap is supported on the ends of the legs above the lugs at a sufficient distance so that a child's mouth placed over the cap cannot engage the neck of the bottle to permit drinking of the contents.

3,716,161
SAFETY CLOSURE FOR A MEDICINE BOTTLE OR THE LIKE

Randall K. Julian, Elberfeld, and Peter R. Gach, Evansville, both of Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 26, 1971, Ser. No. 192,417
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 4 Claims

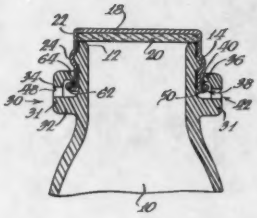


A safety closure for a medicine bottle or the like. The closure and bottle neck have cooperating lug and ramp means of the bayonet type. The closure is placed over the bottle neck, depressed onto the neck and rotated relative to the neck to engage the lugs and ramps. To remove the closure, it is pressed downwardly to disengage the lugs and then rotated in the opposite direction. The closure is biased upwardly relative to the bottle neck by the engagement of an annular conical shoulder on the closure with upwardly turned fingers on a disc-like biasing element that is positioned between the top of the closure and the end of the bottle neck.

3,716,162
TAMPER-PROOF CLOSURE ARRANGEMENT

Albert L. Botkin, 3018 W. Hood Avenue, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 182,073
Int. Cl. B65d *41/20*
U.S. Cl. 215—42 10 Claims

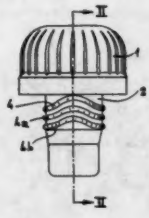


A tamper-proof seal that is located between a container and a cap received on a threaded open end of the container. The tamper-proof seal consists of a flange integral with the container wall adjacent the open end and defining an upwardly opening recess that has a reduced mouth at the upper end. The flange is divided into a fixed portion and a flexible, frangible portion. The cap has an enlarged bead on the lower end thereof that has a dimension greater than the dimension of the mouth to cause outward deflection of the frangible portion when the cap is threaded onto the container and the enlarged bead and frangible portion cooperate to define interlocking elements when the cap is placed in sealing engagement with respect to the open end of the container.

3,716,163
STOPPERS FOR PRESSURIZED CONTAINERS

Henri Marcel, Les Cheres, France

Filed Sept. 7, 1971, Ser. No. 178,354
Claims priority, application France, Nov. 26, 1970, 7043581
Int. Cl. B65d *35/04*
U.S. Cl. 215—47 5 Claims



A stopper made of molded synthetic material comprises a dome-shaped head and a hollow cylindrical body depending therefrom, the said body being closed at its lower end. The periphery of the body is provided with annular protruding ribs which coact with the inside of the bottle neck to insure fluid-tightness and these ribs are of substantially sinusoidal shape,

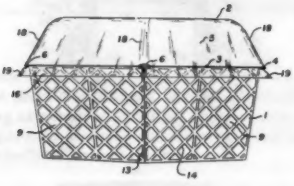
each comprising an even number of undulations or wave lengths. With such an arrangement, if the neck has a zone of somewhat restricted diameter and/or of somewhat non-circular cross-section, as such is often the case with bottles for sparkling beverages, the stopper may nevertheless be easily extracted from the bottle by rotating it within the neck while it is submitted to a pulling force.

3,716,164

BERRY BASKET AND COVER

Everett Fennema, 9607-57 Street, Edmonton, Alberta, Canada

Filed Aug. 24, 1970, Ser. No. 66,281
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R **5 Claims**



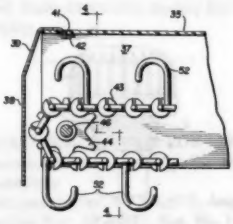
A plastic lattice-work berry basket having a novel locking arrangement is provided. A T-shaped slot network is cut in each corner of the cover. The basket top ridge is provided with sharp, outwardly projecting corners. These corners each engage the vertical slot of one of the networks when the cover is pushed onto the basket. The vertical slots guide the corners into the horizontal slots, into which they snap to lock the basket and cover together.

3,716,165

MERCHANDISING DISPENSING MODULE FOR VENDING MACHINES

William A. Patrick, Mayflower, Ark., assignor to Polyvend, Inc., Conway, Ark.

Filed Apr. 19, 1971, Ser. No. 135,311
Int. Cl. G07f *11/58*
U.S. Cl. 221—85 **4 Claims**



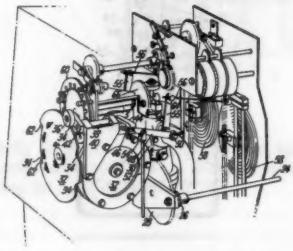
A replaceable, vending machine, merchandise dispensing module having endless conveyor merchandise supporting means wherein the module is provided with a pivoted identification tab corresponding to a merchandise selector button which enables the use of a shorter module and a smaller front-to-back machine dimension while permitting the free fall of merchandise between the front end of the module and the front of the machine.

3,716,166

LIQUID DISPENSING APPARATUS

Colin Roderick Petyt, Middlesex, England, assignor to Avery-Hardoll Limited, Chessington, Surrey, and Beck & Co. (Meters) Limited, London, England

Filed Nov. 5, 1970, Ser. No. 87,043
Claims priority, application Great Britain, Nov. 11, 1969, 55,148/69
Int. Cl. B67d *5/22*
U.S. Cl. 222—15 **3 Claims**



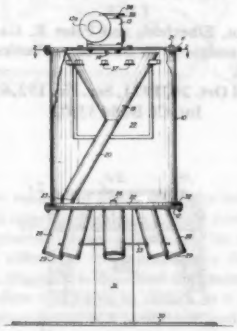
A petrol pump for dispensing a plurality of petrols of different octane ratings having an interlock preventing operation of the motor of the pump whilst the selected blend is being changed.

3,716,167

ROTARY SAMPLE COLLECTOR

Fred R. Huntington, Salt Lake City, Utah, assignor to The Galigher Company, Salt Lake, Utah

Filed March 15, 1971, Ser. No. 123,996
Int. Cl. B67d *5/08*
U.S. Cl. 222—63 **12 Claims**



A rotary sample collector for receiving periodically collected samples of dry, granular materials is the subject of this disclosure. The collector comprises a cylindrical closure containing a rotatable, inverted cone-shaped hopper into which sample material is introduced to be discharged at the cone

apex through an inclined conduit to one of a plurality of collection stations. The collection stations are disposed in a circle about the base of the collector, each station having a tubular member which communicates with the inclined conduit upon rotation of the cone-shaped hopper to sequentially align the lower opening of the inclined conduit with the upper opening of each tubular member of each collecting station.

3,716,168

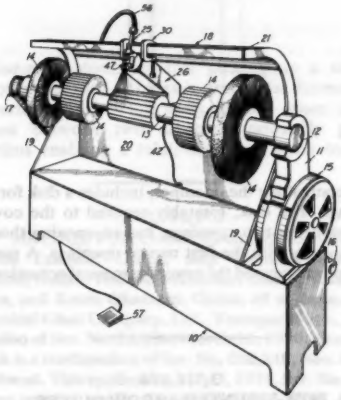
SHOE POLISH DISPENSING DEVICE

Hubert H. Buice, 4 N. Clarendon Rd., Avondale Estates, Ga.

Filed Aug. 27, 1970, Ser. No. 67,341

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 HE **6 Claims**



This invention relates to an improved polish dispensing device for use on a shoe working machine. More particularly, this invention includes a conduit support means removably mounted on a shoe working device at a position above a number of shoe working elements. The conduit means has a shoe polish container supported adjacent one end thereof with a shoe polish heating means located in an opposite end of the conduit. Air pressure means is operatively associated with a dispensing orifice on the shoe polish container for dispensing a quantity of shoe polish therefrom. Control means is operatively associated with the air pressure means for effecting a shoe polish dispensing operation. The shoe working machine includes hood means operatively associated with the shoe working elements and positioned relative to the shoe polish dispensing means whereby air flow created by the shoe working elements will be directed over the heating means for assistance in controlling the temperature of the shoe polish and heating means.

3,716,169

LIQUID LEVEL WINDOW FOR COFFEEMAKERS

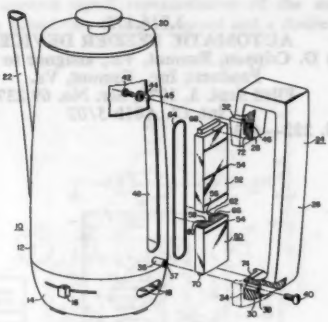
James R. Chivers, Mansfield, Ohio, assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed May 11, 1971, Ser. No. 142,301

Int. Cl. B67d *5/38*

U.S. Cl. 222—157 **2 Claims**

The invention provides a handle and liquid level window assembly for a coffeemaker characterized by a transparent or translucent molded plastic window overlapping an elongated aperture in the coffeemaker and secured in



proper sealing relationship by the coffeemaker handle and its associated mounting means.

3,716,170

CHEMICAL EJECTING FLASHLIGHT

Ralph W. Mangels, Phoenix, Ariz., assignor to Daco Safety Products, Tempe, Ariz.

Filed Oct. 4, 1971, Ser. No. 186,241

Int. Cl. F21v *33/00*

U.S. Cl. 222—162 **14 Claims**

A dual purpose flashlight containing within its casing a pressurized chemical source which may be actuated to dispense a chemical within the range of the rays of its light by a trigger mounted on the exterior of its casing.

3,716,171

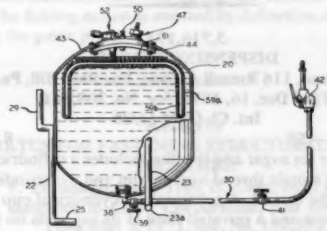
AIRLESS HYDRAULIC SYSTEM SUPPLY

Oscar C. Blomgren, Sr., and Oscar C. Blomgren, Jr., both of North Chicago, Ill., assignors to Tuxco Corporation

Filed Feb. 19, 1971, Ser. No. 116,839

Int. Cl. B67d *5/54*

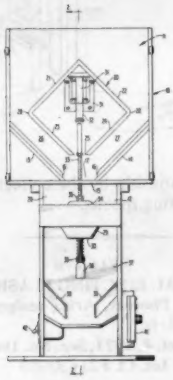
U.S. Cl. 222—396 **16 Claims**



A brake fluid supply vessel with a pressurizable expansible bladder therein for expelling fluid through the bottom of the

vessel. Vents communicate with the bladder and the tank around the bladder to allow exhaustion of air therefrom.

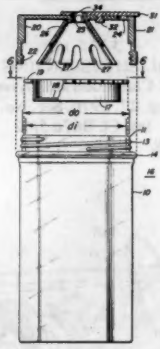
3,716,172
AUTOMATIC FEEDER DEVICE
Huston D. Crippen, Esmont, Va., assignor to Coleswood Products, Inc., Esmont, Va.
Filed Sept. 3, 1970, Ser. No. 69,237
Int. Cl. A01k 5/02
U.S. Cl. 222—453 **1 Claim**



An automatic particulate material dispensing device for dispensing predetermined quantities of material such as particulate feed material at regular intervals for access by animals such as livestock, pets and the like. The dispensing device includes an upper material receiving chamber having a housing structure therein provided with a generally V-shaped bottom configuration which cooperates with inclined surfaces at the bottom of the receiving chamber to form a pair of inclined passageways leading to a discharge opening at the bottom of the chamber whereby the feed material is discharged into a material measuring and dispensing compartment for subsequent dispensing. The housing structure has an inverted V-shaped configuration on its upper end constituting baffle means to break up and divide the flow of particulate material to each of the passageways. A valve located in the compartment is operated by a solenoid located within the housing structure. A valve stem connects the valve to the solenoid and extends through the receiving chamber discharge opening, whereby the valve stem assists in preventing clogging or bridging of material.

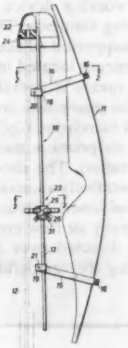
3,716,173
DISPENSING DEVICE
George H. Yasso, 116 Russell Avenue, Fountain Hill, Pa.
Filed Dec. 16, 1971, Ser. No. 208,841
Int. Cl. G01f 11/26
U.S. Cl. 222—455 **8 Claims**

A dispenser for sugar and the like includes a cylindrical container having a male thread near its rim and a circumferential bead below the thread. A substantially cylindrical cup having a closed bottom and a serrated flare at its top rests on the rim of the container and extends into the container to a depth in proximal alignment with the bead in such a manner that passageways are formed with the interior of the container via portions of the serrated flared top. A circular cover, removably mounted on the container in cooperating relation with the male thread, holds the cup in place. The cover has central and off-center discharge openings therein. A measuring funnel is connected to the cover and communicates with its central opening. The funnel has a plurality of spaced notches at its lower end and rests on the bottom of the cup. A



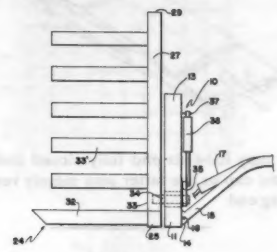
valve, for controlling the openings, includes a disk for closing the openings. The disk, rotatably secured to the cover at a point between the two openings, has an opening therein for selective registry with the first named openings. A portion of the disk projects beyond the cover for manual actuation.

3,716,174
BOW-MOUNTED ARROW QUIVER
Harry C. Ehlert, 5223 Caversham, Houston, Tex.
Filed Jan. 12, 1970, Ser. No. 2,234
U.S. Cl. 224—1 B **9 Claims**



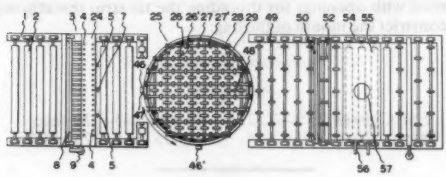
As a preferred embodiment of the present invention, a new and improved arrow quiver is adapted for detachable mounting on any bow irrespective of the style or size of the bow. To accommodate various lengths and diameters of the arrows carried in an upright position thereon, the quiver includes upper and lower spatially-disposed gripping members which can be selectively positioned and adjusted as desired.

3,716,175
STOOK INVERTOR
Floyd Reed Smith, P.O. Box 154, Hillspring, Alberta, Canada
Filed Feb. 3, 1971, Ser. No. 112,281
Int. Cl. B65g 7/00
U.S. Cl. 214—768 12 Claims



A triangular stook invertor picking up a stook consisting of a plurality of bales in triangular formation, and the invertor of turns of stook upside down so that it will nest between two adjacent, normally positioned stooks thus enabling a relatively large stook to be built.

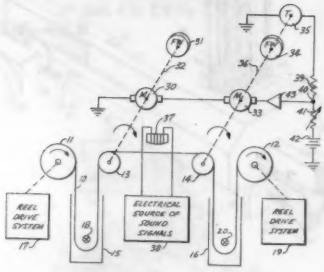
3,716,176
METHOD FOR CUTTING GLASS SHEETS
Tunehiko Yamada, Osaka; Seiji Egami, Nara; Harumi Sasatani, Osaka; Hideaki Matsuoka, Osaka; Saburo Emoto, Osaka, and Kunio Okamura, Osaka, all of Japan, assignors to Central Glass Company, Ltd., Yamaguchi-ken, Japan
Division of Ser. No. 22,126, March 31, 1970, abandoned, which is a continuation of Ser. No. 680,818, Nov. 6, 1967, abandoned. This application May 3, 1971, Ser. No. 139,795
Claims priority, application Japan, Feb. 8, 1967, 42/7657
Int. Cl. B26f 3/00; B26d 3/08
U.S. Cl. 225—96.5 7 Claims



A method for cutting glass sheets, comprising the steps of producing breaking lines longitudinally of and into a face of a glass sheet moving horizontally after being cut from a continuous ribbon of glass transversely thereof into sheets of a predetermined size by a known method, changing the position of said glass sheet relative to the direction of its movement, snapping the glass sheet apart at the breaking lines, and washing and drying the glass sheets thus severed.

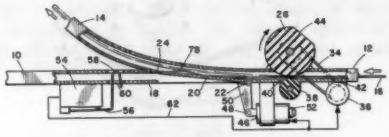
3,716,177
FILM TRANSPORT
Minard A. Leavitt, Sepulveda, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed April 23, 1971, Ser. No. 136,867
Int. Cl. B65h 17/20
U.S. Cl. 226—1 17 Claims

Film is guided in a path that extends across two spaced apart capstans in non-slipping contact therewith. A buffer disposed between a supply reel and one capstan, and a buffer disposed between a pickup reel and the other capstan serve to isolate the film between the capstans from tension variations imposed by the reel drive systems. The capstans are driven by motors that are electrically connected in series. The motors are actuated by a control signal representative of the deviation between the actual film transport speed and a desired value



thereof. The torque responses of the motors and the resultant moments of inertia of the motors and their respective capstans are matched to each other. The film bears a coating of magnetic material suitable for recording sound signals and a recording station is disposed between the capstans in recording proximity to the magnetic coating.

3,716,178
WEB GUIDING AND CORNER FOLDING APPARATUS
Lawrence E. Shimmin, San Diego, Calif., assignor to Copley Press, Inc., La Jolla, Calif.
Filed Dec. 9, 1971, Ser. No. 206,334
Int. Cl. B65h 17/20
U.S. Cl. 226—11 10 Claims

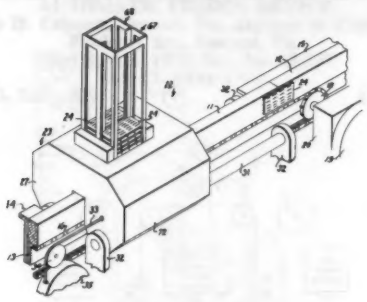


Apparatus for guiding a moving web of material, such as paper, film, or the like, and folding the corners of the leading edge of the moving web to stiffen the leading portion and facilitate automatic feeding through processing means. Folding is accomplished by a guide plate having shaped apertures into which the leading corners of the web are guided as the web advances. With the corners retarded in the apertures, continued motion of the web causes the corners to be folded back. The folding action is assisted by deflection of the web by moving the guide plate.

3,716,179
APPARATUS FOR FASTENING STRUCTURAL MEMBERS TOGETHER
Donald V. Frydenberg and Troy D. Cain, both of Arlington, Tex., assignors to Clary Corporation, San Gabriel, Calif.
Filed May 3, 1971, Ser. No. 139,579
Int. Cl. B27f 7/02
U.S. Cl. 227—48 13 Claims

Apparatus for attaching wooden structural members together in end-to-end relation using nail plates, in which the

members are moved continuously through a fastening station. A carriage, located at the station, is clamped to one of the wooden members and a floating press carried by the carriage

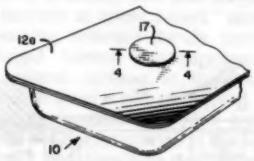


is actuated to embed the nail plates into opposite sides of adjoining members during movement of the carriage along with the members. Following the embedding operation, the carriage is released and spring returned to an initial position.

3,716,180
PACKAGING

Robert P. Bemiss, Hillsborough, and Alexander Donald, Woodside, both of Calif., assignor to Robalex, Inc., San Francisco, Calif.

Filed June 1, 1970, Ser. No. 41,921
Int. Cl. A47j *27/04*
U.S. Cl. 229—43 **6 Claims**



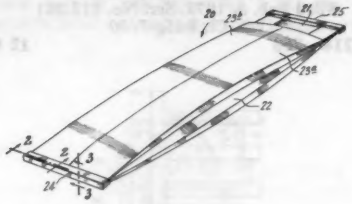
The carton and package provide a heat-releasable connection for a closure for a package which is to be heated for use wherein the heat sealed connection will become ineffective when subjected to boiling water conditions. In one form, the closure is a lid for a tray type container. In the second form the closure is a small closure for a small aperture in the lid wherein the size of the aperture is such that it will act as a one-way valve when the package is heated underneath the surface of the water to allow escape of steam or vapor under pressure and to prevent the ingress of water.

3,716,181
PAPER BAG CONSTRUCTION

Dominick Terzuoli, 2258 East 70th Street, Brooklyn, N.Y.

Filed March 9, 1971, Ser. No. 122,321
Int. Cl. B65d *31/10*
U.S. Cl. 229—57 **3 Claims**

A bag, for example, for dust collection in a vacuum cleaner, is comprised of a paper tube which is flattened at least at one end to there provide superposed paper plies and end edges of the paper plies are embedded in an elongated, self-supporting cap of thermoplastic material which extends across the flattened end of the tube and at least partly closes such end. The

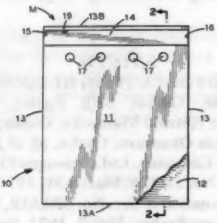


paper tube may have its end fully closed and sealed by the thermoplastic cap or the latter may merely restrict the opening of the bag end.

3,716,182
COMBINATION BAG AND CLOSURE

Meyer Korn, 1980 South Ocean Drive, Hallandale, Fla.

Filed April 12, 1971, Ser. No. 133,249
Int. Cl. B65d *33/16*
U.S. Cl. 229—62 **8 Claims**



A plastic film bag provided with an accompanying closure member; the closure member being a flexible tie strip detachably secured to the bag; the mouth of the bag being formed with openings for threading the tie strip therethrough to constrict the mouth of the bag.

ERRATA

For Classes 235—7, 235—26 and 235—70 see:
Patents Nos. 3,716,694, 3,716,695 and 3,716,702

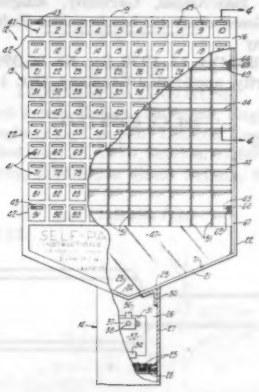
3,716,183
PARKING LOT COIN RECEPTACLE

Manuel J. Chaves, Huntington Beach, Calif., assignor to Parking Company of America, Santa Ana, Calif.

Continuation of Ser. No. 851,984, Aug. 21, 1969, abandoned.
This application Oct. 13, 1971, Ser. No. 189,020
Int. Cl. G07b *15/00*
U.S. Cl. 232—1 R **5 Claims**

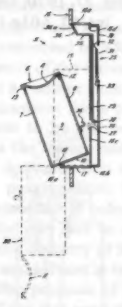
A closed box has formed on one wall a plurality of numbered slots to receive coins. The slots are in register with corresponding pigeonhole compartments inside the box, the compartments having sloping bottom walls. Each numbered slot relates to a corresponding stall in a self-service parking lot on which the box is located. After parking in a numbered stall, a customer goes to the box and inserts the appropriate coin through the correspondingly numbered coin slot. At intervals, an attendant arrives to inspect the coin compartments through a transparent rear cover to see that all occupied stalls are properly paid for. The coins are thereupon released by moving the transparent cover away from the compartments, allowing the coins to drop from the sloping bottom walls through a

restricted opening into a receptacle, and warning notes are placed on nonpaying vehicles. Access to the interior of the



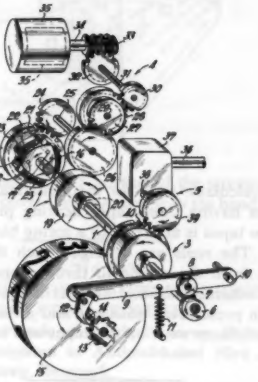
box is afforded by an opening covered by a locked member, but the coin compartments and the receptacle cannot be reached by the servicing attendant.

3,716,184
TRASH RECEPTACLE
Ralph Beach Mott, Sr.; Ralph Beach Mott, Jr., and Richard C. Cantella, all of Houston, Tex., assignors to Reserv-A-Roll Co.
Filed March 11, 1971, Ser. No. 123,323
Int. Cl. B65d *91/00*
U.S. Cl. 232—43.1 **1 Claim**



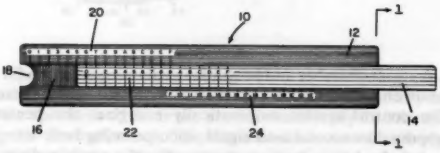
A trash receptacle including a hinge cover for the top, said container being carried on a support which extends therebeneath with hinge means for connecting the support to the bottom of the container to enable the container to be pivoted forwardly and downwardly for emptying of the container. Concealed latch means are provided to retain the container in a normally upright position for receiving trash, such concealed retaining means including hook means mounted on the back of the container, which hook extends through an opening in an adjacent plate carried by the support. Spring loaded plunger means is normally engaged with the hook means by an operating tab that is connected with the plunger means and extends laterally therefrom. The operating tab is actuated by a portion of the spring loaded plunger means, which portion is concealed from view but which may be engaged for movement of the spring loaded plunger to disengage the hook means from the spring loaded plunger to enable the container to be pivoted forwardly and downwardly for emptying.

3,716,185
TAXIMETER DRIVE WITH CONSTANT TIME DRIVE SPEED
Heinz Kelch, Buchenberg, and Eduard Schuh, Villingen, Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany
Filed Apr. 30, 1971, Ser. No. 138,955
Claims priority, application Germany, May 2, 1970, P 20 21 598.9
Int. Cl. C07b *13/00*
U.S. Cl. 235—30 R **5 Claims**



The fare representing shaft of a taximeter is driven by one-way clutches from distance and time drive means. While the distance drive means drive the shaft at varying speeds, the time drive means has a motor which rotates at a continuously constant speed so that undesired simultaneous driving of the shaft by both drive means, can take place only momentarily when, during driving of the shaft by the distance drive means, the varying speed of the shaft is momentarily equal to the constant speed at which the time drive means drives the shaft.

3,716,186
HEXADECIMAL SLIDE RULE
Kent B. Comfort, Tulsa, Okla., assignor to Mar-Com Development, Inc., Tulsa, Okla.
Filed Nov. 17, 1971, Ser. No. 199,495
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **3 Claims**

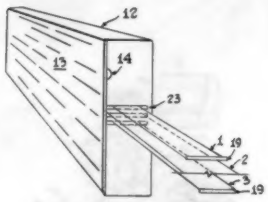


Disclosed herein is a method for the rapid addition and/or subtraction computation of higher order mathematics. The method is particularly applicable for alphameric manipulations, for example, for the operations of hexadecimal subtraction and addition.

3,716,187
TAPE CALCULATOR

Dan Olof Jonsson, deceased, late of Coquitlam, British Columbia, Canada, and by Kajsa Greta Jonsson, administratrix, c/o Lennox Associates & Co., P.O. Box 8717, Station H, Vancouver 5, British Columbia, Canada

Filed May 14, 1970, Ser. No. 37,319
Int. Cl. G06c 27/00
U.S. Cl. 235—71 A 1 Claim

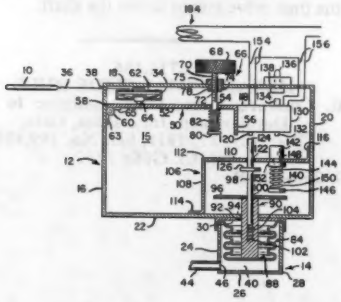


A tape calculator used for mathematical calculations and conversions having three tapes bearing preselected indicia. Each of the tapes is attached to a spring biased reel mounted in a case. The reels are arranged such that the tapes are withdrawn from the casing in three geometric planes, one above the other. A locking member is provided to maintain the tapes in preselected positions and a cleaning member on the casing reduces wear on the tapes and keeps the tape surface clean.

3,716,188
STEAM GENERATOR CONTROL

Robert J. Shulz, Brookfield, Ill., assignor to Vischer Products Company

Division of Ser. No. 765,351, Oct. 7, 1968, Pat. No. 3,571,563.
This application April 10, 1970, Ser. No. 31,450
Int. Cl. G05d 16/02, 27/00
U.S. Cl. 236—92 R 6 Claims

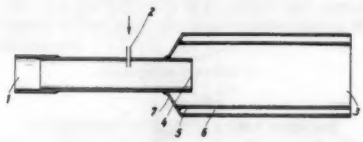


A steam chamber and heater for generating steam to fill said steam chamber in combination with a control system therefor. The control system automatically energizes the heater in response to a combined signal, incorporating both temperature and pressure measurements, when the combined signal is below a predetermined level and automatically deenergizes the heater when the combined signal exceeds said predetermined level. The control system also deenergizes the heater in response to signals indicating maximum individual predetermined levels of temperature or pressure, and thereby acts as a temperature and pressure override safety system. Deenergization of the heater by one of the override controls requires manual reenergization of the heater.

3,716,189
METHOD OF AN APPARATUS FOR ATOMIZING LIQUID DROPLETS IN THE SPRAYJET OF A SPRAYING DEVICE

Otto Locher, Isny/Allgau, Germany, assignor to Heimo Geratebav Gesellschaft mit beschrankter Haftung, Isny/Allgau, Germany

Filed Oct. 13, 1970, Ser. No. 80,399
Claims priority, application Germany, Oct. 14, 1969, P 19 51 812.8
Int. Cl. B05b 7/00
U.S. Cl. 239—8 8 Claims

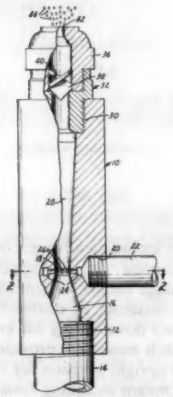


An arrangement for atomizing a liquid spray in a gaseous jet, according to which the liquid spray to be atomized is introduced into a flow of a gaseous jet so as to create a region of mist preparation into which fine droplets collected in the marginal area of the atomized mist are returned from the area of ejection of the atomized mist.

3,716,190
ATOMIZING METHOD

James A. Lindlof, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 27, 1970, Ser. No. 84,509
Int. Cl. A01g 15/00
U.S. Cl. 239—2 S 9 Claims



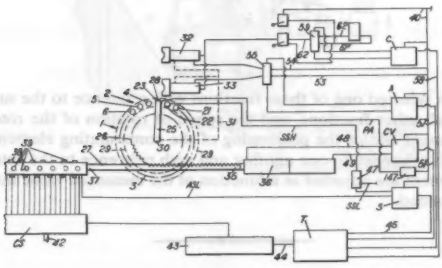
A method for atomizing a liquid which comprises the steps of 1) forming a dispersion of minute gas bubbles in a flowing enclosed pressurized liquid, said liquid and gas being the continuous and dispersed phases respectively, and 2) subsequently forcibly expelling the dispersed system through an hydraulic atomizing nozzle into an ambient atmosphere to provide an expanding stream of minute droplets. The preferred apparatus for carrying out the method of the inven-

tion is a venturi tube fitted at one end with an hydraulic atomizing nozzle, the compressed gas being introduced into the liquid at the throat of the venturi.

3,716,191
LIQUID SPRAYING GUNS

Howard Richard James Knight, Hampton, England, assignor to Carrier Engineering Company Limited, London, England

Filed Aug. 28, 1970, Ser. No. 67,869
Claims priority, application Great Britain, Sept. 3, 1969, 43,668/69
Int. Cl. B05b *1/30*
U.S. Cl. 239—112 **9 Claims**



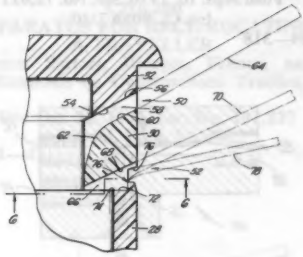
A spray gun for spraying articles such as automobile bodies fed in succession is automatically controlled by a selectively operable valve having a plurality of liquid delivery ports and gun purging ports. The liquid delivery ports are connected one each to sources of liquid of different colors and the gun purging ports to a source of compressed gas and a source of solvent. A single hollow arm connected by a feed hose to the gun is movable relative to the ports of the valve under control of a program unit and a timer in a manner such that when the program unit signals the requirement for a change of color the timer causes the hollow arm to be moved from the current liquid delivery port first to the compressed gas gun purging port so that a slug of air is delivered into the hollow arm and then to the solvent gun purging port so that solvent is delivered to complete the emission of colored liquid from the arm, the feed hose, and the gun and to effect cleansing of these parts preparatory to the delivery of liquid of a different color. The compressed gas and solvent is fed at a pressure sufficient to maintain the feeding pressure of liquid remaining in the arm, the feed hose, and the gun until the liquid is emitted from the gun.

3,716,192
EXTENDED RANGE SPRINKLER HEAD

Edwin J. Hunter, Riverside, Calif., assignor to Moist O'Matic Division of Toro Manufacturing Corporation, Minneapolis, Minn.

Filed May 27, 1971, Ser. No. 147,515
Int. Cl. B05b *1/34*
U.S. Cl. 239—205 **9 Claims**

An irrigation sprinkler head having two sets of nozzle holes arranged one above the other, the top nozzle holes being inclined upwardly at an angle to attain maximum range, and being designed to produce minimum turbulence so that the streams are coherent and break up at a considerable distance out from the head. The lower nozzle holes throw their streams at a slightly flatter angle for shorter range, and are designed to produce some turbulence so as to cause their respective streams to break up at a shorter distance out from the head. The streams issuing from the lower nozzle holes fan out laterally and strike a deflector shelf having a flatter angle than

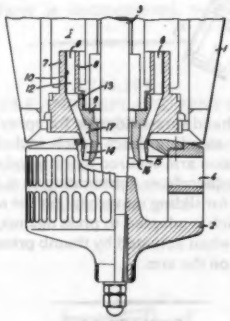


the streams, and this causes a portion of the streams to break up immediately to cover the area closest to the head.

3,716,193
LIQUID DISTRIBUTOR FOR FEEDING LIQUID TO A ROTATING ATOMIZER

Keith Masters, Skovlunde, and Orla Straarup, Birkerod, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Gladsaxevej, Soborg, Denmark

Filed May 10, 1971, Ser. No. 141,560
Claims priority, application Denmark, May 15, 1970, 2516/70
Int. Cl. B05b *3/02*; F23d *11/04*
U.S. Cl. 239—222 **5 Claims**



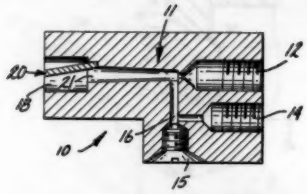
A liquid distributor for feeding liquid to a rotating cup-shaped atomizer wheel, in the sidewall of which a plurality of ejection apertures of ducts are provided uniformly distributed along the circumference. The distributor consists of a body mounted coaxially with the atomizer wheel, said body being provided with a number of helical ducts, the helical axis of which coincide with the axis of the atomizer wheel and terminate in an annular conduit which is coaxial with the atomizer wheel and terminates with an ejecting edge inside the wheel. The helical ducts impart a rotating motion in direction of atomizer wheel rotation to the liquid which is finally flung out from the ejecting edge against the sidewall of the cup-shaped wheel.

3,716,194

COMBINATION HIGH PRESSURE VENTURI AND SPRAY FORMING NOZZLE

Carl A. Miller, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Sept. 16, 1970, Ser. No. 72,621
Int. Cl. B05b 7/30
U.S. Cl. 239—318 6 Claims



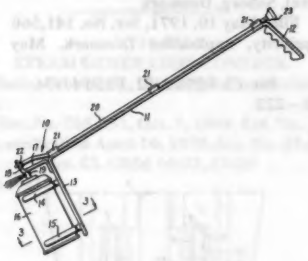
A combination venturi and spray nozzle for drawing a liquid cleanser into a high pressure water flow and then forming the combined flow of water and aspirated cleanser into a spray pattern for use in a cleansing operation.

3,716,195

EXTENSION HAND SPRAYER DEVICE

George E. Silva, 1857 41st Ave., Sacramento, Calif.

Filed July 29, 1971, Ser. No. 167,119
Int. Cl. A01g 25/14
U.S. Cl. 239—375 1 Claim



An extension hand sprayer device for spraying a line on the pavement while standing erect which includes a spray can holder, an extension arm secured thereto and extending a substantial distance therefrom terminating in a handle. A push button mounted for sliding movement on the arm is connected to a member which is adapted to press against the push button of the spray can when actuated by thumb pressure on the push button mounted on the arm.

ERRATUM

For Class 241—1 see:
Patent No. 3,715,983

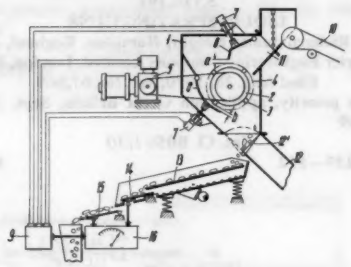
3,716,196

METHOD OF OPERATING AN IMPACT COMMINUTOR

Herbert Motek, Essen-Werden, and Jakob Jobkes, Muenster-Westfalen, both of Germany, assignors to Hazemag, Hartzerkleinerung-Und Zement-Maschinenbau-Gesellschaft M.B.H., Munster, Germany

Filed April 14, 1971, Ser. No. 133,973
Claims priority, application Germany, April 17, 1970, P 20 18 496.7
Int. Cl. B02c 13/09
U.S. Cl. 241—27 9 Claims

An impact comminutor has a rotor element and movable comminuting elements mounted outwardly and circumferentially spaced about the rotor element. Material to be comminuted is admitted into the apparatus to thereby undergo comminution into larger and smaller fractions and in this shape leave the machine. The comminuted material is then subjected to measurements to determine the proportion



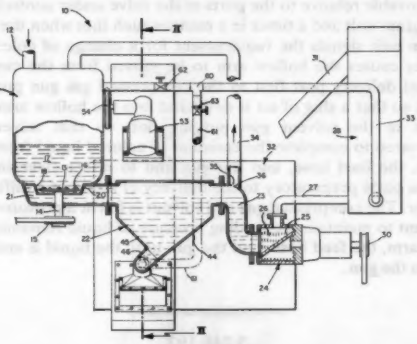
of a selected one of these fractions with reference to the sum of all other fractions, and the speed of rotation of the rotor element and/or the positioning of the comminuting elements with reference to one another and with reference to the rotor element are adjusted as a function of the measured value thus obtained.

3,716,197

WASTE DISPOSAL APPARATUS

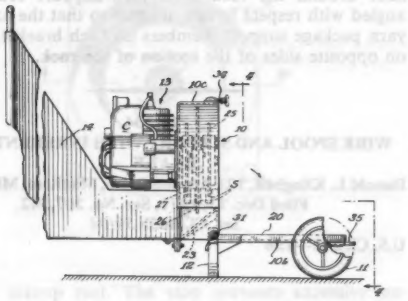
Sam N. Craig, Devon; Ellis R. Warner, Jr., West Chester, and Wayne T. Buckman, Pipersville, all of Pa., assignors to Wascon Systems, Inc., Hatboro, Pa.

Filed Nov. 16, 1970, Ser. No. 89,852
Int. Cl. B02c 18/40
U.S. Cl. 241—43 6 Claims



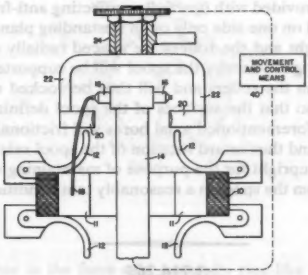
An apparatus is provided, wherein waste solids are prepared for disposal. The solids are wet pulped into a slurry form, having some solid material therein, with the solids then passing into a trap, whereby larger solid particles that have not been sufficiently reduced in size in the pulper may be collected at the bottom, for carriage by an ejector toward which the particles may optionally receive assistance from a water line, to discharge receptacle. The slurry passes from the trap into another apparatus which further comminutes solids carried by the slurry, for delivery to a press, whereby water is extracted therefrom, with the water then being recycled to the pulper, and with the compacted solids from the press being discharged into the discharge receptacle. A vent is provided, at the outlet of the trap.

3,716,198
SHREDDER
Robert D. Lautzenheiser, Bluffton, Ind., assignor to The Red Cross Manufacturing Corp.
Filed April 9, 1971, Ser. No. 132,657
Int. Cl. B02c *18/06*
U.S. Cl. 241—188 R 7 Claims



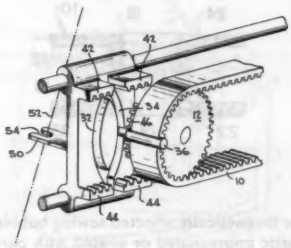
A leaf shredder with a motor, hopper, shredding top wall and side wall hinged to a wheeled bottom wall to allow exposure of shredding knives and cooperating elements for inspection.

3,716,199
STATOR WINDING MACHINE
Gene S. Ericson, Cridersville, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 842,648, July 17, 1969, abandoned.
This application Dec. 1, 1971, Ser. No. 203,816
Int. Cl. H02k *15/09*
U.S. Cl. 242—1.1 R 8 Claims



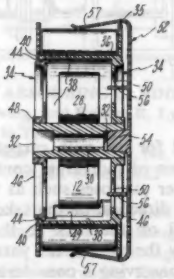
In a stator coil winding machine having a wire dispensing gun rotatable about the stator core axis, there is provided a moving form separately rotatable about the same axis as the gun and shaped to force wire radially outwardly about fingers corresponding to core slots. When the moving form is withdrawn and the gun axially reciprocated to the other core end, the wire is seated deeply in the core slot with minimum end turn length of the coils. The form may be configured so that it is versatile over a wide coil span and winding the various coils of a single stator may be accomplished with a single form.

3,716,200
APPARATUS FOR RECIPROCATING A TRAVELLER
Roland Ernest Sartori, Riorges, France, assignor to Ateliers Roannais de Constructions Textiles, Roanne, France
Filed Oct. 21, 1971, Ser. No. 191,227
Int. Cl. B65h *54/30*
U.S. Cl. 242—43 6 Claims



Apparatus for reciprocating a traveller carrying a yarn guide for delivering yarn to be wound on a bobbin including an endless belt driven by a pair of pulleys and carrying a shoe slidably engaging a groove in the traveller, the groove having a pair of symmetric curved branches for alternately receiving the shoe as the shoe is moved around the pulleys, whereby the sinusoidal change in linear speed of the traveller as the shoe moves around the pulleys is compensated.

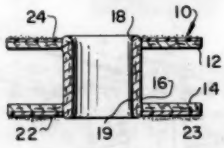
3,716,201
COILABLE RULE AND REPLACEMENT CARTRIDGE THEREFOR
Robert F. West, Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed May 4, 1970, Ser. No. 34,080
Int. Cl. B65h *75/48*
U.S. Cl. 242—107 8 Claims



A coilable rule is provided with a casing and a self sustaining replacement cartridge comprising a spool member rotatably mounted on a separate hub which has recesses in its end for non-rotatable engagement with truncated studs in the casing,

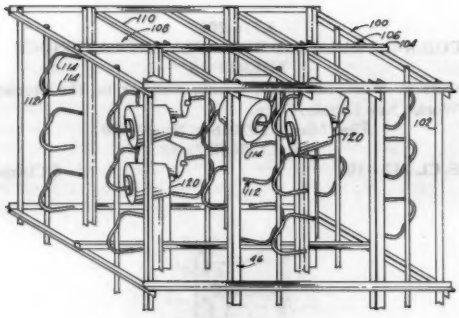
a coiled blade, and a recoil spring attached to the blade and the hub. The spring tension is factory adjusted and maintained until assembled in the casing by a keeper.

3,716,202
MAGNETICALLY ATTRACTED BOBBINS
Charles C. Thomas, Starkville, Miss., assignor to Mississippi State University Development Foundation, Inc., State College, Miss.
Filed Jan. 13, 1971, Ser. No. 106,026
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.7 **7 Claims**



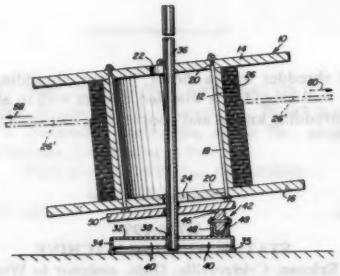
Disposable magnetically affected sewing bobbins formed of paper or plastic impregnated or coated with particulate iron powder or other magnetically affected material.

3,716,203
BOBBIN CREEL
Max M. Beasley, Chattanooga, Tenn., assignor to Tuftco Corp., Chattanooga, Tenn.
Filed Feb. 8, 1971, Ser. No. 113,551
Int. Cl. B65h *49/02;* **D02h** *1/00;* **D03j** *5/08*
U.S. Cl. 242—131 **11 Claims**



Especially suited for use with carpet tufting machines which use a number of individual continuous yarns, but also useful for other purposes such as weaving and knitting processes, the direction of the take off points of the yarns are arranged on the rack so that the converging triangles formed by the axes of the yarn cones are nested together thereby conserving a considerable portion of the lost triangle of space present in previous creel designs. In one form of the present creel arrangement a rack is constructed from vertical and horizontal angle iron members and the bobbins are removably supported on cone holder brackets bent in a shape similar to bicycle handlebars which are welded in the middle to a post and each handle provides a member on which a bobbin or yarn package is removably supported. The direction of the take off points of the yarn is so arranged alternately so that the converging triangles formed by the axes of the yarn cones are nested together and in one form space is conserved within the rack but more aisles are necessary which is a most convenient creel to service because all the distances are reduced and it is easy to reach every point in the creel. Another form saves over 20% of floor space compared to an old style creel. There is no aisle inside the rack and all servicing is performed from the floor around the rack. The yarn support brackets are angled with respect to one another so that the axes of the yarn package support members on each bracket converge on opposite sides of the ~~section of the rack~~.

3,716,204
WIRE SPOOL AND SUPPORT WITH INHERENT DRAG BRAKE
Donald L. Klingbeil, 121 Atwood Drive, Mankato, Minn.
Filed Dec. 13, 1971, Ser. No. 207,342
Int. Cl. B65h *59/04*
U.S. Cl. 242—156 **8 Claims**

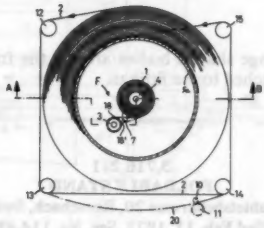


A support for a wire spool of the type having opposite end walls provided with aligned generally axial bores. The support includes a base provided with a central upright downwardly over which the spool is loosely telescopingly receivable and the base is provided with upwardly projecting anti-friction rollers disposed on one side only of an upstanding plane containing the upright and the rollers are spaced radially outwardly from the upright whereby the spool will be supported on only one side from the rollers and will thus be cocked relative to the upright so that the surfaces of the spool defining at least one of the aforementioned axial bores will frictionally engage the upright and thus retard rotation of the spool relative to the support and upright for the purpose of maintaining wire being unwound from the spool in a reasonably taut condition.

3,716,205
CASSETTE FOR MAGNETIC TAPE OR THE LIKE
Winfried Geuder, Furth-Sack, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig, Furth-Bay, Germany
Filed Aug. 28, 1970, Ser. No. 67,855
Claims priority, application Germany, Oct. 20, 1969, P 19 52 723.3
Int. Cl. G11b *23/10*
U.S. Cl. 242—194 **9 Claims**

A tensioning device for the non-convoluted portion of magnetic tape whose ends are secured to the cores of coaxial supply and takeup reels mounted in the housing of a cassette or cartridge. The tensioning device has an S-

shaped spring one end portion of which is convoluted on a roller which is coaxial with and supported by the supply reel. The other end portion of the spring is convoluted on a roller which is eccentric to and supported by the supply reel. The width of the end portions exceeds the width of the major central portion of the spring and such end portions form shoulders which can abut against complementary shoulders provided on a stop which is integral



with the takeup reel. The stop prevents excessive unwinding of the end portions from the respective rollers to thus prevent undue flexing and breakage of the spring ends. The spring winds itself onto the roller of the takeup reel when the rotational speed of the takeup reel exceeds the speed of the supply reel during the first half of transfer of tape onto the takeup reel, and thereupon onto the roller of the supply reel when the speed of the supply reel exceeds the speed of the takeup reel.

3,716,206

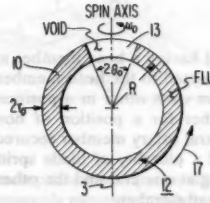
NUTATION DAMPER

Ralph Sylvester Lynch, Trenton, and Khaled Bou Ayache, Cranbury, both of N.J., assignor to RCA Corporation

Filed Nov. 16, 1970, Ser. No. 89,936

Int. Cl. B64g *1/10*

U.S. Cl. 244—1 SA **14 Claims**



A damper in the form of a generally ring-like container of viscous fluid filling a substantial portion of the container the remaining portion of which defining a void or bubble. The container is spun by being oriented within a spinning portion of a spacecraft or is provided with means to spin relative to the stable body portion of a spacecraft. Centrifugal forces on the fluid in the presence of nutational motions will develop oscillations of the bubble relative to the spinning axis of the container to generate energy losses thereby reducing nutation motion. Fluid resonance is developed with bubbles of selected size in ring-like containers. Resonance is also developed in a U-shape configuration having different sized cross-sectional portions.

3,716,207

AIRCRAFT WITH ONE OR SEVERAL TURBOJET ENGINES HOUSED IN THE FUSELAGE AFT SECTION IN PODS PROVIDED WITH THRUST-REVERSING DEVICES

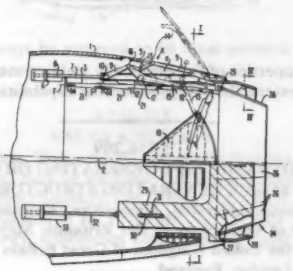
Ludwig Schweikl, 8052 Moosburg, and Alfred Japs, 8031 Grobenzell, both of Germany, assignors to Motoren-und Turbinen-Union Muenchen GmbH, Postfach, Munich, Germany

Filed May 27, 1970, Ser. No. 40,763

Claims priority, application Germany, May 29, 1969, P 19 27 280

Int. Cl. B64d *27/00*

U.S. Cl. 244—53 R **9 Claims**



An aircraft with one or several turbo-jet engines arranged in the aft section of the fuselage or in pods and equipped with thrust-reversing devices which include rearwardly directed after-burner jet pipes with associated adjusting thrust nozzles; several gas discharge apertures are provided in the engine fairing which are adapted to be opened and closed by inner flaps and outer flaps or deflecting scoops constructed as component parts of the outer wall of the engine fairing; the inner flaps close the gas discharge apertures in the position for forward thrust conditions and open the same in the position for thrust reversal while simultaneously deflecting the engine gases in the direction of the gas discharge apertures; the outer flaps or deflecting scoops which open or close the gas discharge apertures operate in unison with the adjusting movement of the inner flaps; the thrust-reversing installation is arranged within an area directly upstream of the adjusting thrust nozzle of the after-burner jet pipe of a respective engine while the inner flaps form triangular sectors of the after-burner jet pipe wall and the associated heat shield which substantially completely close the after-burner jet pipe by the circular area formed thereby when the outer flaps or deflecting scoops are in the fully open position.

3,716,208

ENERGY ABSORBING LANDING GEAR

Castle H. Fagan, Irving, and Robert R. Lynn, Arlington, both of Tex., assignors to Textron, Inc.

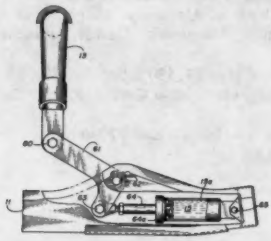
Filed June 11, 1970, Ser. No. 45,363

Int. Cl. B64c *25/52*

U.S. Cl. 244—108 **15 Claims**

A landing gear for helicopters in which a member having a static spring rate and plastic yielding characteristics is mounted in series with a member having a static spring rate and a velocity-sensitive restraining force. The combination serves to provide for appropriately "soft" landings under conditions of light gross weight and/or low vertical descent speed, and is also capable of absorbing the forces generated during "hard" or crash landings under conditions of heavy gross weight and/or high vertical descent speed. By designing the yield point of the plastic yielding member to a force approxi-

mately equal to the resistance offered by the velocity-sensitive unit at the time that is "bottoms out," the efficient energy ab-

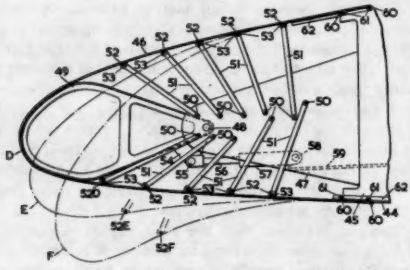


sorbing properties of the plastically yielding member are employed to extend the energy absorbing capabilities of the gear.

3,716,209
FLUID DYNAMIC LIFT GENERATING OR CONTROL FORCE GENERATING STRUCTURES

Donald Pierce, Aldershot, Hampshire, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 1, 1970, Ser. No. 42,082
Int. Cl. B64c *3/48*
U.S. Cl. 244—123 **9 Claims**



In a fluid dynamic structure having an outer wall or skin defining a fluid dynamic profile part of the outer wall is flexible and has movable support apparatus and power apparatus are provided for effecting movement of the support apparatus and the flexible part whereby the fluid dynamic profile of the structure is changed.

The invention is applicable to the leading edge of an aircraft wing and also to auxiliary control surfaces such as flaps and ailerons.

3,716,210
PC CONCRETE PIPE REINFORCEMENT STRUCTURE

Yoshikiyo Fukushima, Yasushi Ishihara, and Kenzo Momota, Tokyo, Yasuo Usui, Chigasaki, and Tuyoshi Sakumura, Satoru Sogo, and Koji Nunokawa, Tokyo, Japan, assignors to Nippon Concrete Industries Co., Ltd., Tokyo, Japan

Original application Jan. 29, 1969, Ser. No. 794,900. Divided and this application Jan. 18, 1971, Ser. No. 107,582
Int. Cl. E04c *5/08*
U.S. Cl. 245—1 **5 Claims**

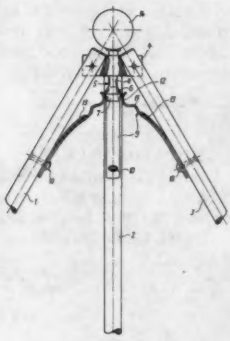
PC concrete pipe reinforcement having tensioned vertical reinforcements attached to end fittings, freely movable cage shaped bodies within the tension reinforce-

ments, and cage shaped bodies around the freely movable body and attached to the fittings.

3,716,211
FOLDABLE STAND

Josef Butz, Muhletsbelstrasse 20, Rorschach, Switzerland

Filed Feb. 11, 1971, Ser. No. 114,489
Claims priority, application Switzerland, Feb. 12, 1970, 2033/70
Int. Cl. F16m *11/38*
U.S. Cl. 248—168 **2 Claims**



A foldable stand having a head member and at least three legs pivotally connected to the head member so that the legs can be spread from each other in a position of use and adjacent to each other for a position of non-use. The head member has a central rotary member secured to and depending therefrom and a plurality of blade springs are provided secured to each leg at one end and the other end pressing in contact with the head member.

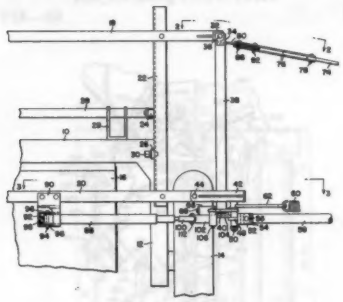
3,716,212
SPRAYER BOOM LEVELING AND FOLDING APPARATUS

Robert Eugene Fox, Minburn, Iowa, assignor to Deer & Company, Moline, Ill.

Filed Sept. 27, 1971, Ser. No. 183,879
Int. Cl. B05b *1/20*
U.S. Cl. 248—278 **13 Claims**

A sprayer boom is pivotally connected to a generally upright support member for movement about an upright axis between working and transport positions. The support member is pivotally connected at its upper end to a boom mounting frame. A hydraulic cylinder is interconnected with the support member and boom to move the support member outwardly upon initial extension and to

fold the boom from its working position to its transport position upon additional extension. The construction per-



mits the use of a single cylinder to control both the leveling and folding of the sprayer boom.

3,716,213

VEHICLE SEATS HAVING RESILIENT MOUNTINGS

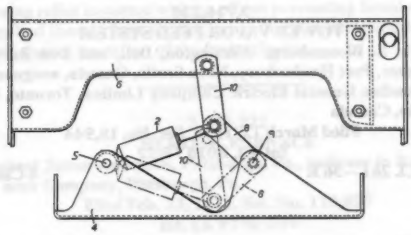
Robert R. Lacey, Northampton, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 19, 1971, Ser. No. 117,025

Claims priority, application Great Britain, Feb. 21, 1970, 8,426/70

Int. Cl. F16m *11/00*

U.S. Cl. 248—399 **4 Claims**



A vehicle seat comprises a seat part resiliently mounted for upwards and downwards movement relative to a base part, a vibration damper being connected between the seat part and base part by a linkage which acts to produce an increasing damping effect with increasing travel of the seat part upwards or downwards from a Ride-position.

3,716,214

TELEPHONE DIRECTORY HOLDER

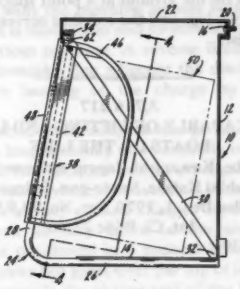
Leslie A. Hannula, Waukegan, Ill., assignor to Acoustics Development Corporation, Northbrook, Ill.

Filed Feb. 24, 1971, Ser. No. 118,234

Int. Cl. A47b *27/04*

U.S. Cl. 248—447 **3 Claims**

A telephone directory holder in which the directory is pivotally mounted on a generally upright, inwardly directed tube which, in combination with a stop limiting the outward movement of the directory holder, assures that the directory



holder will always be returned to its inner position when it is released by the user.

3,716,215

VALVE ASSEMBLY

Jack Washbourn, Malmesburg, and Philip Norman Paginton, Chippenham, both of England, assignors to Westinghouse Brake & Signal Company, Ltd., London, England

Filed March 24, 1971, Ser. No. 127,449

Claims priority, application Great Britain, April 17, 1970, 18,455/70

Int. Cl. F16k *51/00*

U.S. Cl. 251—358 **3 Claims**

A valve assembly characterized by a valve element including a rigid circular support member provided with a central opening and on which support member a shaped body of resilient material passing through the central opening and disposed on both sides of the support member is bonded, the peripheral portion of the support member being deformable to permit clamping or securing of the valve element to a valve carrier member.

3,716,216

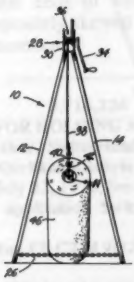
METHOD AND APPARATUS FOR LIFTING ONE END OF A ROLL OF CARPETING OR THE LIKE

George A. Kirkpatrick, P.O. Box 693, Ridgecrest, Calif.

Filed April 17, 1970, Ser. No. 29,426

Int. Cl. B66c *23/60*

U.S. Cl. 254—139.1 **1 Claim**



A portable hoist comprising a frame having two legs that converge upwardly, and a winch at the upper end, having a depending lift cord. The legs of the frame are placed one on

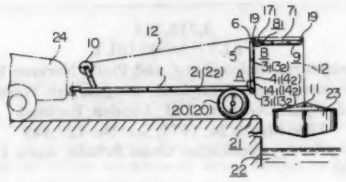
either side of a long, heavy roll of carpeting at one end thereof, and the lift cord is attached to a pole, or pipe, that is inserted into the roll. As the one end of the roll is lifted, its other end bears on the ground at a point spaced laterally outward from the two legs and the roll thus serves as a third leg to stabilize the hoist.

3,716,217

TRAILER CAPABLE OF LIFTING AND LOWERING BOATS OR THE LIKE

Masahiro Watabe, Kawanishi, Japan, assignor to Usui Kokusai Songyo Kabushiki Kaisha, Sunto-gun, Shizuoka-ken, Japan

Filed Dec. 1, 1970, Ser. No. 93,935
Int. Cl. B66c *23/60*
U.S. Cl. 254—139.1 **2 Claims**



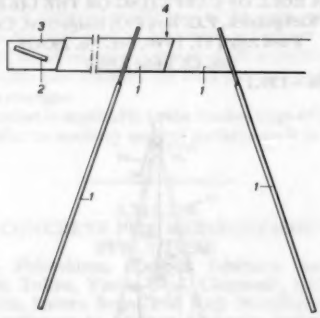
A trailer capable of lifting and lowering boats or the like which includes a trailer body of the type known per se having a winch device mounted thereon, and a foldable crane assembly pivotally connected to the rear end of the trailer body, whereby the crane assembly can be moved between a raised or operative position and a folded or inoperative position.

3,716,218

MEANS FOR CONSTRUCTION OF COLLAPSIBLE RAILINGS

Odmund Sanne, Oslo, Norway

Filed Mar. 9, 1971, Ser. No. 122,480
Claims priority, application Norway, Mar. 16, 1970, 94,070
Int. Cl. E01f *13/00*
U.S. Cl. 256—64 **5 Claims**



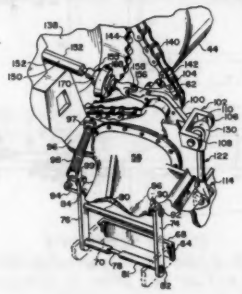
Means for the construction of barricades, road barriers etc., in which a plurality of identical members may be assembled to supports and rails as desired.

3,716,219

ROLLER ALIGN DRIVE

Eugene J. Miller, 3912 W. Oak St., McHenry, Ill.

Filed Sept. 20, 1971, Ser. No. 181,770
Int. Cl. B28c *5/18, 5/42*; F16h *7/14*
U.S. Cl. 259—177 R **18 Claims**



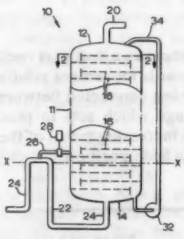
A mounting is disclosed imparting several degrees of freedom to fixed or semi-fixed drive units which maintains coplanar relationship between a drive sprocket or sheave and a driven sprocket or sheave and overcomes the tendency of the drive chain or belt to become detached or subject to extreme wear under the influence of displacement forces acting on their spaced axes. In one embodiment the mounting includes a traversing radial torque anchor in combination with a radial follower arm to support the drive member axis parallel to the axis of the driven member and to maintain the drive axis in a relatively fixed circumferential position to the driven axis. The follower arm has a roller intermediate its ends which rolls against the side of the driven member under bias and the extended end is pivoted to the journal holding the drive member in its drive position. Other embodiments are disclosed.

3,716,220

TOWER VAPOR FEED SYSTEM

Marvin S. Bloomsburg, Wilmington, Del., and Don Barkley Nazzer, Port Hawkesbury, Nova Scotia, Canada, assignors to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed March 12, 1970, Ser. No. 18,944
Int. Cl. B01d *59/32*
U.S. Cl. 261—36 R **4 Claims**



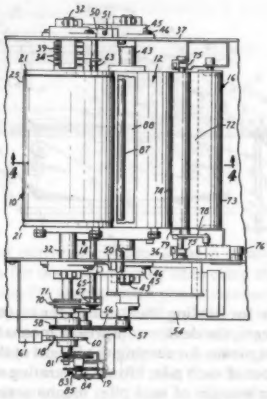
A tower for counterflow contacting of downflow liquid with up-flowing gas is provided with a U-bend bottom gas entry located to trap the liquid inventory of the tower in the bend and the drain-down portion of the tower. A gas bypass connects the U-bend to the tower at a level above the drain-down level, to permit ready circulation of gas in the tower before the liquid inventory is displaced from the trap.

3,716,221

FUSING DEVICE

Donald J. Gorka, Mahtomedi, and Harold B. Laskin, Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 4, 1971, Ser. No. 103,725
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 118—60 10 Claims



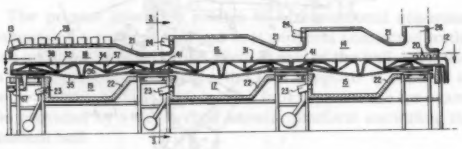
A fusing device for fusing thermoplastic resinous particulate material to a receptor sheet. The fusing device includes a fusing roller having a resilient fusing blanket supported on the periphery thereof and heating means to heat the fusing blanket to a temperature sufficient to fuse the particulate material. A backup roller is urged toward engagement with the deformable fusing blanket to press the receptor sheet carrying the particulate material into contact with the fusing roller. The fusing roller is coated with an off-set preventing liquid which is applied thereto from the backup roller at predetermined intervals during operation of the fusing device.

3,716,222

HEATING FURNACE

Robert James Anderson, Pittsburgh, Pa., assignor to Rust Furnace Company, Pittsburgh, Pa.

Filed Feb. 23, 1971, Ser. No. 118,027
Int. Cl. F27b *9/14*
U.S. Cl. 432—133 27 Claims



A heating furnace comprising a hearth which includes charge supporting members each comprised of an upper tubular member and a lower tubular member connected together by an intermediate tubular member to form a rigid, water cooled truss. The furnace may be divided into a series of heating zones by top and bottom partitions from which the furnace is end fired.

In one embodiment a first series of trusses is movable longitudinally while a second series of trusses is alternately movable vertically to convey a charge through the furnace. Alternatively, certain of the trusses may be fixedly mounted, while others are mounted for movement both longitudinally and vertically in the furnace. The trusses are supported at each bottom partition with the movable trusses being mounted on a carriage which is movable in and forms a traversing seal over a slot in the bottom partition. A reverse fired bottom soaking zone and a downtake flue adjacent the discharge end of the furnace insure heating of the charge by hot gases until discharge.

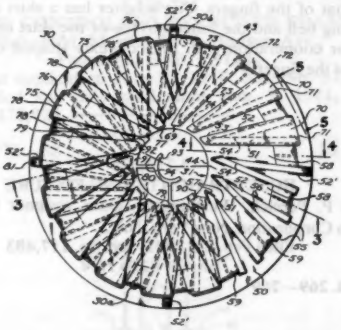
Another embodiment includes charge supporting members movable both longitudinally and vertically in the furnace and constructed of two sections connected together to permit independent relative vertical movement with respect to each other to cause closely packed charges on the first section to become spaced as they move to the second section. A downtake flue positioned in a preheat zone underneath the first section draws hot gases over the top of the charges on the first section towards the charge end of the furnace and back underneath the charges to heat the bottom.

3,716,223

LOAD SUPPORT DIFFUSER AND METHOD OF MANUFACTURE

Robert Lee Corbett, Jr., 22732 Westlake Road, Rocky River, Ohio 44116

Filed Feb. 10, 1971, Ser. No. 114,151
Int. Cl. F27d *5/00*
U.S. Cl. 432—260 9 Claims



There is disclosed herein a load support diffuser adapted to support a vertical stack of coils in an annealing furnace and diffuse a protective atmosphere gas within said furnace, the diffuser comprising a flat circular base plate, V-shaped flow divider members mounted on top of the plate and having the apices thereof directed inwardly to define a central opening for a blower and defining outwardly directed flow passages, deflectors for diffusing the gas upwardly at the outer ends of the flow passages, and a double layer of oppositely skewed support bars carried by the flow divider members.

3,716,224

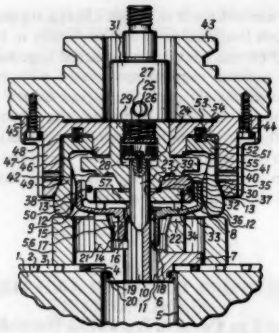
DEVICE FOR HOLDING A WORKPIECE

Max Gross, Winterthur, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikoon-Buhrle AG, Zurich, Switzerland

Filed July 22, 1970, Ser. No. 57,075
Claims priority, application Switzerland, July 23, 1969, 11241/69
Int. Cl. C21d *9/32, 1/64*
U.S. Cl. 269—48.1 3 Claims

A holder for a workpiece having a tubular portion to be used during quenching when hardening the same. A centering element grips the workpiece from the inside and clamping

means grips the tubular portion from the outside at the level of the centering element. The clamping means has an adapter with a clamping bell movable axially therein. The bell is resiliently radially deformable with its internal diameter substantially equal to the external diameter of the workpiece to be quenched. The wall of the clamping bell is divided by axial



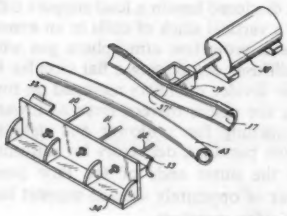
incisions into a plurality of fingers which have convexly shaped inner and outer surfaces and the transverse dimension of the wall is less between the base of the bell and the fingers than that of the fingers. The adapter has a skirt circling the clamping bell and the inner surface of the skirt has a conical face for cooperation with the convexly shaped outside surfaces of the fingers.

3,716,225

HOSE STRAIGHTENING FIXTURE

Phillip P. Percich, Worthington, Ohio, assignor to Amerace Esna Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,483
Int. Cl. B25b *1/24*
U.S. Cl. 269—269 **5 Claims**



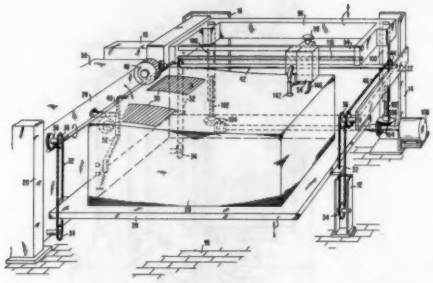
A fixture for holding curved rubber hose so that the ends thereof are substantially aligned comprising a pair of spaced members each of which is formed in the vertical plane in the configuration of an arc with said members having the same axis and a third member which is also arcuate in the vertical plane and which in the horizontal plane is in the configuration of a wedge, said third member being relatively movable toward and away from said spaced members whereby the point of the wedge can intercept the axis of the spaced members and press against a hose outside curvature to reverse the curvature of the hose.

3,716,226

SHEET FEEDER

Hermann Kistner, Neckarweihingen, Germany, assignor to Maschinebau Oppenweiler GmbH, Oppenweiler near Backnang, Germany

Filed Nov. 23, 1970, Ser. No. 91,702
Int. Cl. B65h *1/18*
U.S. Cl. 271—31 **12 Claims**



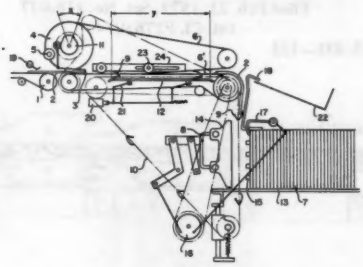
A device for feeding sheets of paper or the like from a pile of such sheets, the device comprising means for lifting a pile of sheets; first means for sensing the height at the front margin of the top sheet of such pile; lifting, separating and suction means at the rear margin of said pile; means arranged at the front margin of said pile for receiving and transferring the sheets one after the other from said pile; second sensing means for sensing the height of the pile at its rear margin; control means for stepwise changing the height of the separating and lifting means at the rear margin of the pile of sheets under the influence of said first sensing means; and means operated by said lifting means controlling the raising of said pile so as to hold also its front margin at the proper height for the reception of the top sheet by said receiving and transferring means.

3,716,227

SHEET CONVEYING DEVICE

Rolf Bottcher, Markkleeberg-Ost, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Austrustungen

Filed Feb. 8, 1971, Ser. No. 113,468
Int. Cl. B65h *29/28, 9/14*
U.S. Cl. 271—79 **6 Claims**



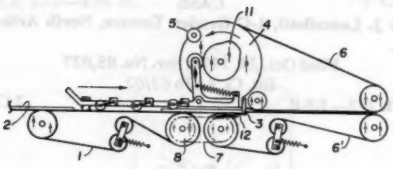
Control system for the conveying of sheets, comprising sheet conveying means defining a sheet conveying path, means in the sheet conveying path for stopping and releasing the sheets with a predetermined periodicity and means for equalizing the distance between consecutive sheets subsequent to the release of the sheets from the sheet stopping and releasing means.

3,716,228

APPARATUS FOR CONNECTING AN UNCADENCED APPARATUS TO A FOLLOWING CADENCED APPARATUS FOR THE HANDLING OF SHEETS

Rolf Bottcher, Markkleeberg-ost, Germany, assignor to VEB Polygraph Leipzig Kimbinat fur Polygraphische Machinen und Ausrustungem, Leipzig, Germany

Filed Feb. 8, 1971, Ser. No. 113,466
Int. Cl. B65h *7/02, 9/14*
U.S. Cl. 271—47 **2 Claims**



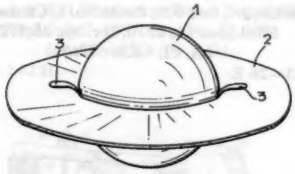
In a method of conveying sheets along a sheet conveying path from means for non-periodically delivering the sheets to means for receiving the sheets with a predetermined periodicity comprising stopping the sheets in the path and releasing the sheets with the same periodicity as the receiving means, the improvement comprising operating the receiving means at a higher rate of sheets receivable per unit time than the average rate of sheets delivered per unit time at which the delivering means is operated.

3,716,229

RECREATIONAL APPARATUS

Rafael J. J. Van Der Cleyen, Erwetegem, and Wilfried F. Ribbens, Hillegem, both of Belgium, assignors to Les Usines Fabelty Societe Anonyme, Bastogne, Belgium

Filed March 26, 1970, Ser. No. 22,749
Claims priority, application Belgium, March 31, 1969, 730763
Int. Cl. A63b *25/08*
U.S. Cl. 272—57 E **11 Claims**



The present invention relates to a recreational apparatus comprising a resilient ball and foot supports connected to the ball on opposite sides of the vertical axis of the ball, such that in use a person disposed on the foot supports is capable to bounce above a floor surface. The foot supports are for example provided by a single rigid annular platform encircling the resilient ball.

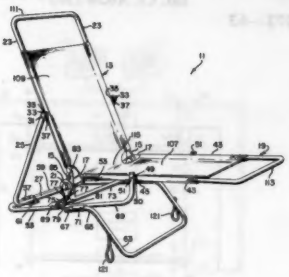
3,716,230

EXERCISING COT

Morris Mark, 4147 Mantova Drive, Los Angeles, Calif. 90008

Filed Mar. 8, 1971, Ser. No. 122,037
Int. Cl. A63b *23/02*
U.S. Cl. 272—58 **10 Claims**

An exercising cot convertible to a fixed chair, a slant board, and a flexible body supporting exerciser and having a pair of body supporting fabric covered and pivotally interconnected frame sections, one of such frame sections being supported intermediate its length by a first pivotally connected leg member and the other such frame section being supported intermediate its length by a pivotally connected frame supporting member having its end pivotally interconnectible to the ends of the first leg member, the frame supporting member being in turn supported by a second leg member pivotally connected to the frame supporting member intermediate its length but restricted in its pivotal movement thereabout.

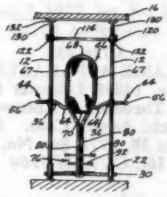


3,716,231

USER CONTROLLED EXERCISER FRAME

Robert M. Martin, 90 N. Hudson Ave., Pasadena, Calif. 91101

Original application July 23, 1970, Ser. No. 57,532. Divided and this application Aug. 9, 1971, Ser. No. 170,028
Int. Cl. A63b *23/02*
U.S. Cl. 272—58 **10 Claims**



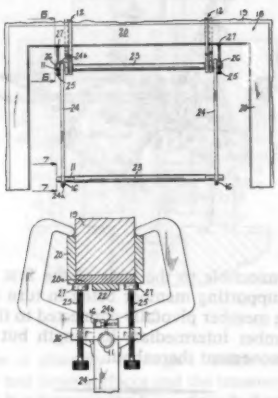
An exercise device including a pair of upright poles interconnected by top and bottom cross members. U-shaped members are pivotally and slidably connected to the poles to provide parallel handles when pivoted to an inwardly extending position and provide supports for a pivotal bed frame when the U-shaped members are pivoted outwardly. The bed frame is pivoted such that the center of gravity of the exerciser will be shifted back and forth across the pivotal axis by moving the hands from the sides towards the head. A canvas material supports the buttocks, back and head while a pair of cross elements engage the ankles and the feet. The cross elements are adjustable along the length of the body frame and with respect to each other. A pair of U-shaped hooks may be secured to the exerciser's ankles and engage the top cross bar to suspend the exerciser in an inverted position or engage one of the cross elements on the body frame to hold the exerciser satationary on the body frame as he pivots from an upright position to an inverted position.

3,716,232

EXERCISE APPARATUS FOR ATTACHMENT TO AN OVERHEAD FRAME

Donald A. Johnson; Louis V. Milani, and Anthony L. Massini, all of North Haven, Conn., assignors to Micron Research and Development Corporation, Hamden, Conn.

Filed June 5, 1970, Ser. No. 43,856
Int. Cl. A63b *1/02*
U.S. Cl. 272—63 10 Claims



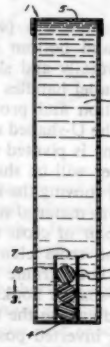
Exercise apparatus for attachment to an overhead support or frame comprising a pair of clamps and an elongated bar held horizontally at each end thereof by the clamps. Each clamp comprises a pair of support members having apertured lower ends concentrically overlapping to receive an end of the bar. Intermediate portions of the support members are angled such that the apexes of the angles point away from each other. The clamps are further secured on the bar by a pair of yokes disposed one across each end of the bar. A pair of set screws through each of the yokes abut the underside of the overhead frame so as to stabilize the position of the clamps below the frame.

3,716,233

GAME APPARATUS

Donald J. Koterwas, 14838 Leicester Court, Centreville, Va. 22020, and Theodore L. Koterwas, P.O. Box 5574, W. Village Branch, Aspen, Colo. 81611

Filed June 28, 1971, Ser. No. 157,425
Int. Cl. A63f *7/04*
U.S. Cl. 273—1 L 4 Claims



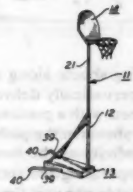
A game apparatus providing a test of manual maneuvering skill comprises a liquid filled chamber defined by a transparent side wall and closed opposite ends and a tubular receptacle mounted on and extending from one end of the chamber and having an open end in facing relation with the other end of the chamber to receive in a selected order each of a plurality of objects therein after turning the chamber end-for end. The objects each have a different specific gravity and thereby a different rate of fall or downward movement through the chamber.

3,716,234

BASKETBALL EQUIPMENT SUPPORT WITH CARRYING CASE

Joseph J. Lancellotti, 1-G Graden Terrace, North Arlington, N.J.

Filed Oct. 29, 1970, Ser. No. 85,027
Int. Cl. A63b *63/02*
U.S. Cl. 273—1.5 R 2 Claims



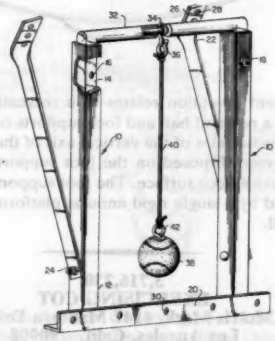
A collapsible basketball goal comprising a backboard made up of two pivoted sections held in their assembled position by means of stirrup members mounted to the respective sections with support straps extending therebetween. The backboard is mounted on a collapsable tubular upright support which in turn is mounted through an aperture to an anchor shoe in the base by shoe hinge couplings. Braces extend from the tubular support through further apertures in the base to further anchor shoes. The base comprises a first slidable member having the aforesaid apertures and a second slidable member over the first to keep the pieces from falling out of the base when stored therein.

3,716,235

BALL PRACTICE DEVICE

John W. Yerkie, Jr., Box 408, Route No. 1, Clinton, Md.

Filed June 16, 1970, Ser. No. 46,772
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 E 2 Claims



Ball practice support structure providing high strength, durability, and adjustable features while being collapsible for shipment and storage. This support structure is adaptable to either overhead, sidewall, or combination of overhead and

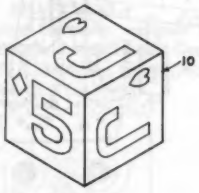
sidewall mounting. Telescopic support arms permit adjustment of the position of a tethered ball in relation to overhead or sidewall.

3,716,236

DICE APPARATUS FOR PRACTICING BIDDING AND PLAY IN CONTRACT BRIDGE

Wayne O. Pangborn, 1974 Sea View, Del Mar, Calif. 92014

Filed Sept. 30, 1971, Ser. No. 185,217
Int. Cl. A63f 1/00, 9/04
U.S. Cl. 273—138 R 7 Claims



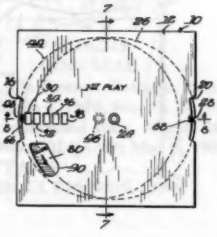
For practicing bidding and planning the play of the hand in contract bridge, a game-like apparatus comprises twenty-six dice. Each of the dice has representations of two cards of different suits on selected ones of its six faces. Only one honor card is represented on any one die, and on each die having an honor card represented thereon the honor card is represented on a majority of the faces of such die. By not having two cards of the same suit on any one die a "perfect" hand of all one suit is possible, and by having the honor cards represented on a majority of the die faces, chance favor hands which are stronger than average, thus providing better bidding situations and fewer hands "passed out." A pair of racks preferably are provided to hold in alignment the thirteen dice of each of two persons, acting as partners, and seated on opposite sides of a table.

3,716,237

PLURAL ROTATABLE DISC INFORMATION DISPLAY DEVICE

Richard E. Locher, 921 Heatherton Drive, Naperville, Ill.

Filed July 7, 1970, Ser. No. 52,956
Int. Cl. A63f 1/00, 5/04
U.S. Cl. 273—142 H 4 Claims



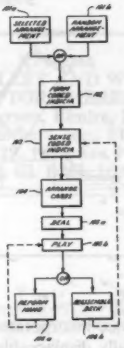
A novel device for displaying selected information comprising two partially superimposed rotatable discs mounted on independent axes between two apertured cover panels. Information indicia are disposed on the discs and are visible through the apertures in the cover panels and through selected apertures in the discs. Movable closure means are provided to conceal portions of the indicia beneath the cover panel apertures until the player shifts the position of the closure means simultaneously revealing first a portion of the information, and then the remaining information.

3,716,238

METHOD OF PREARRANGING PLAYING CARDS FOR EDUCATIONAL AND ENTERTAINMENT PURPOSES

Brooks W. Porter, 9102 Tooley, Houston, Tex.

Filed July 13, 1970, Ser. No. 54,431
Int. Cl. A63f 1/14
U.S. Cl. 273—149 P 2 Claims



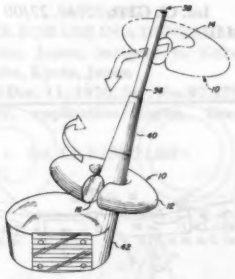
A playing card having indicia arranged thereon permitting arrangement of a deck of such cards into a plurality of predetermined dealing sequences by a new and improved method of forming the indicia in a deck of the cards, and prearranging the deck for dealing in accordance with the indicia, which arranges decks of cards in predetermined sequences and which results in selected playing hands for educational or entertainment purposes.

3,716,239

WEIGHTING DEVICE FOR GAME CLUB INCLUDING TAPERED SHAFT

Noel G. Goudreau, Kankakee, Ill., assignor to Goudreau-Behan Incorporated

Filed Jan. 7, 1972, Ser. No. 216,026
Int. Cl. A63b 69/36
U.S. Cl. 273—194 A 5 Claims

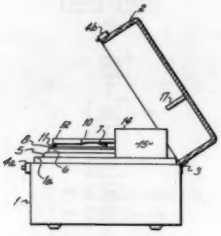


A warm-up weight for athletic implements such as golf clubs having an enlarged head with a tapered stub having its point of smallest diameter connected to a tapered shaft having its narrower end connected to the stub. The warm-up weight includes a rigid generally annular core having a compressible casing thereon and including an axial passage and a generally radial channel permitting insertion of the weight onto the implement. In use, the narrower end of the tapered shaft is passed through the radial channel into the axial passage, the weight is slid down along the tapered stub into frictional engagement therewith, and the weight is rotated approximately 90°.

3,716,240
RECORD PLAYER HAVING A CHILD-PROOF DEVICE

Edward G. Freeman, 163 Yamate-cho, Nak-ku, Yokohama, Japan

Filed Sept. 8, 1970, Ser. No. 70,312
Int. Cl. G11b *1/00*
U.S. Cl. 274—2 3 Claims

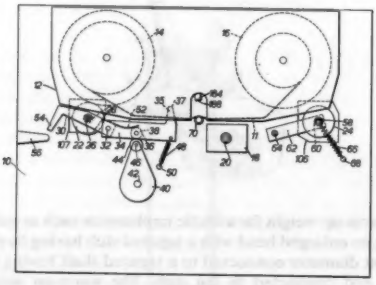


A "child-proof" device incorporated in a record player is comprised of a vertically displaceable arm carrier having a self-positioning means for a pickup arm and to be depressed upon closure of a cabinet lid so that the stylus of a pickup head automatically engages with a starting point of the recorded groove of a record mounted on a turntable. A first switch means is provided which becomes operative upon closure of the lid to close a circuit including an electric motor and a power supply therefor. Second and third switch means become operative to close the circuit only when the pickup arm is positioned correctly by the self-positioning means. Upon termination of the sound reproduction of the entire recorded groove of the record, the pickup head is automatically lifted above and away from the record surface as then the pickup arm slides upwardly on a tapered face means.

3,716,241
DRIVE APPARATUS FOR TAPE PLAYBACK APPARATUS

Wilfred H. G. Rayner, London, England, assignor to Clarke and Smith Manufacturing Company Limited

Filed April 9, 1970, Ser. No. 26,901
Claims priority, application Great Britain, April 11, 1969, 18,762/69
Int. Cl. G11b *15/44, 27/00*
U.S. Cl. 274—4 D 7 Claims

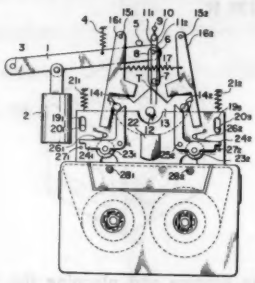


In a tape recording and playback machine for language teaching or for a dictation system, the tape can be fed at both fast and slow forward and reverse speeds. Sound recorded on the tape can be reproduced during slow reverse winding as well as slow forward winding. The drive shift mechanism can be controlled by solenoids, remotely or at the machine.

3,716,242
TAPE DRIVE REVERSAL MECHANISM FOR TAPE RECORDER

Yoshio Maruyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Claims priority, application Japan, Sept. 29, 1969, 44/76900
Int. Cl. G11b *15/20*
U.S. Cl. 274—4 D 5 Claims

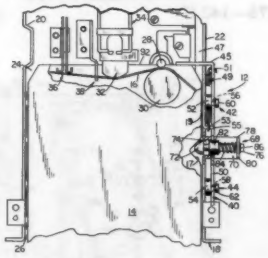


A tape drive reversal mechanism for a tape recorder using two reels is initiated by actuation of a plunger and the like. In response to the actuation of the plunger, an eccentric cam is rotated in either clockwise or counterclockwise direction a certain angle alternatively and locked in position, whereby, through appropriate mechanisms, driving of either one of the two reels is effected, and a head and one of pinch rollers are set in operative position or out of operation.

3,716,243
CARTRIDGE LOCKING MECHANISM

Donald V. O'Neal, Rivergrove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 18, 1971, Ser. No. 107,201
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 B 12 Claims



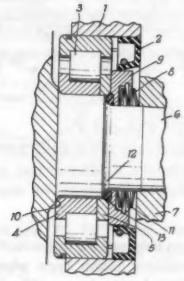
A cartridge locking mechanism for a tape player having a tunnel for receiving a tape cartridge, comprises an actuator arm mounted for movement in the direction of insertion and withdrawal of the cartridge in the tunnel and a plunger mounted for movement into and out of the tunnel in accordance with the movement of the actuator arm for receipt in a groove in the cartridge wall to secure the cartridge in the tunnel. The actuator arm includes a portion extending into the tunnel in the path of the cartridge for engagement therewith. The arm is resiliently biased toward the open end of the tunnel and includes a key-hole shaped aperture therein. The plunger

passes through the key-hole aperture and is captured normally in the smaller portion thereof, out of the tunnel. The plunger, being resiliently biased toward the tunnel is prevented from movement thereinto. When a cartridge is inserted into the tunnel, the extension portion of the actuator arm is engaged by the cartridge, moving the actuator arm to align the larger portion of the key-hole aperture with the plunger, permitting the latter to pass therethrough and into the groove in the cartridge wall. Removal of the cartridge forces the plunger out of the groove and permits the actuator arm to spring back to its normal position, recapturing the plunger.

3,716,244
SHAFT SEAL

Karl Hellwig, Weinheim, Germany, assignor to Farymann Diesel, Farny & Weidmann, Lampertheim, Germany

Filed Dec. 16, 1970, Ser. No. 98,763
Int. Cl. F16j *15/38*
U.S. Cl. 277—65 **3 Claims**

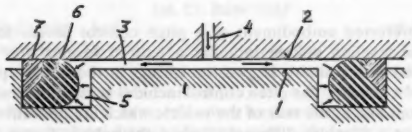


A seal, shaft and housing assembly in which a shaft end projecting from a machine housing bore carries a first rotary member. A second rotary member carried on the shaft is held against a collar portion of the shaft internally of the housing by an axial preload element in the form of a cup spring. The cup spring fits in a recess in an abutment ring which is carried on the shaft and which contacts the second rotary member, and acts between the abutment ring and the first rotary member. An elastic seal is disposed around the shaft in a seating between the abutment ring, second rotary member and a shoulder on the shaft and is deformed to abut in force-locking and sealing manner on the abutment ring, second rotary member and shaft shoulder. A sliding ring sealing element provides a seal between the machine housing bore and the abutment ring.

3,716,245
RING SEAL

Marco Turolla, 213, Via Toscana, Bologna, Italy

Filed March 4, 1970, Ser. No. 16,408
Claims priority, application Italy, March 10, 1969, 6862 A/69; March 29, 1969, 6914 A/69; May 8, 1969, 7009 A/69; Feb. 14, 1970, 12477 A/70
Int. Cl. F16j *9/06, 15/00*
U.S. Cl. 277—176 **5 Claims**

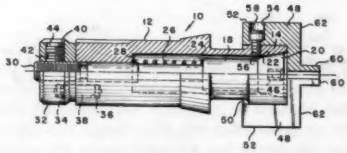


In a ring seal for effecting a seal between two opposed sealing faces, which may be plane or curved faces, one of the sealing faces is provided with a groove the opening from which faces the other of the sealing faces. In the groove there are located an annular rubber-elastic sealing element which is compressively pre-loaded and a locating element made of a material harder than that of the sealing element. On compression of the sealing element to a predetermined degree above that of the pre-load the sealing element urges the locking element partly out of the groove to abut the sealing face opposite the opening from the groove.

3,716,246
EXPANDING COLLET AND WORK GRIPPING ADAPTOR THEREFOR

Anders Adolf Peterson, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,431
Int. Cl. B25b *3/00*
U.S. Cl. 279—2 **12 Claims**

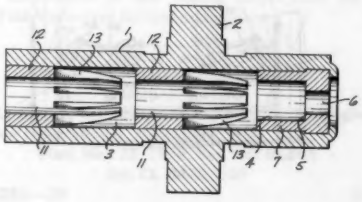


An expanding collet for machine tools including a tubular body portion having a longitudinal axis and a plurality of slots dividing the tubular body portion into a hub portion and a plurality of fingers extending from the hub portion and having inner and outer surfaces, an adaptor member mounted on the outer surface of the free end of each of the fingers and extending beyond the free end of each of the fingers, each of the adaptor members having an inner surface coincident with the outer surface of the fingers, the adaptor members each including a portion beyond the free end of the fingers and extending radially inward toward the longitudinal axis, the adaptor members each including an outer surface longer than its respective inner surface.

3,716,247
METAL CHUCK FOR USE IN A DENTAL HANDPIECE

Kenzo Sato, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Dec. 11, 1970, Ser. No. 97,179
Claims priority, application Japan, Dec. 25, 1969, 44/104553
Int. Cl. B23b *31/08*
U.S. Cl. 279—15 G **3 Claims**



A metal chuck for use in a dental handpiece for holding a dental tool which comprises a tubular body and a plurality of

claws integral with the body. The chuck is secured in the axial through bore of the air-turbine rotor enclosed in the handpiece. A dental tool is inserted through the tubular body to be secured by friction between the contacting surfaces of the body and the tool, with the claws resiliently clamping the tool thereby holding the same all the more securely in the chuck.

3,716,248

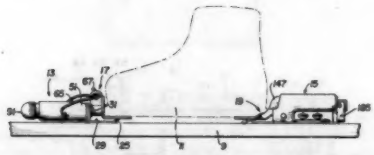
TENSION ADJUSTABLE RELEASABLE SKI BINDING AND METHOD

Philip K. Wiley, 326 West 7th Street, Traverse City, Mich.

Filed July 29, 1970, Ser. No. 59,207

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 T **11 Claims**



The present invention relates to releasable ski bindings for retaining boots to skis during normal skiing and releasing the boots from the skis under abnormal conditions. Forward and rear boot mounts cooperate with forward and rear ski mounts through a multiple action toggle at the rear ski mount to permit lateral heel release from beneath the toggle against the forward resilient force but heel roll out and vertical release are enabled through toggling of the toggle means upwardly and backwardly. Momentum or decelerating release is facilitated through telescoping the forward boot mount into the forward ski mount against the resilient force.

3,716,249

ARRANGEMENT FOR STABILIZING TRAILING VEHICLE AXLES

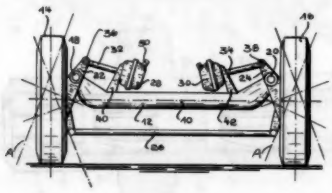
Friedrich Schaeff, Bensheim-Auerbach, Germany, assignor to Sauer, Otto Achsenfabrik, Keilberg uber Aschaffenburg, Germany

Filed Sept. 9, 1970, Ser. No. 70,675

Claims priority, application Germany, Sept. 9, 1969, P 19 45 589.1

Int. Cl. B62d 15/00

U.S. Cl. 280—81 A **4 Claims**



A trailing vehicle axle having telescopic piston rods connecting the steering knuckles with the pistons of pneumatic cylinders, the pistons during straight-ahead motion holding the wheels in fixed position subject to the air pressure. In a turn, one piston rod lengthens telescopically without effort and the other enters the cylinder against the air pressure.

3,716,250

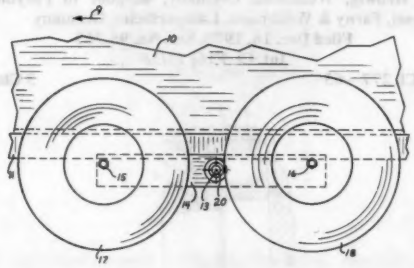
BOGIE AXLE

Thomas J. Gorres, Benson, Minn.

Filed March 1, 1971, Ser. No. 119,553

Int. Cl. B62d 61/00

U.S. Cl. 280—104.5 A **2 Claims**



The present invention relates to a construction in a bogie or tandem axle of the walking beam type wherein the axis of pivoting of the walking beam is specifically located with respect to the axes of the wheels being supported to minimize bouncing of the walking beam, improve towing characteristics, and to develop improved flotation characteristics over conventional walking beam systems.

3,716,251

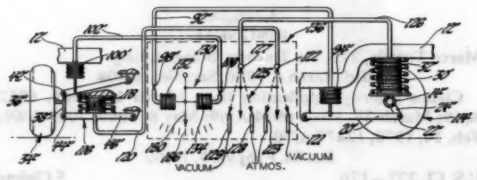
VEHICLE PITCH CONTROL DEVICE

Gerard T. Klees, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1971, Ser. No. 163,833

Int. Cl. B60g 17/04

U.S. Cl. 280—124 F **6 Claims**



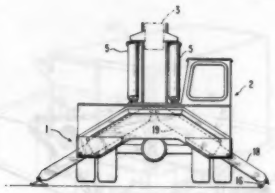
A preferred embodiment of a pitch control device for a vehicle leveling system includes a pair of leveler unit associated with primary suspension springs in the rear suspension of a vehicle. The pitch control includes sensing bellows at the front and at the rear of the vehicle which are operative to produce a pressure differential when the vehicle frame and chassis are pitched either from front to rear or from rear to front of the car and wherein a valve controller responds to the pressure differential to regulate the levelers to compensate for the pitched relationship. Other embodiments are illustrated.

3,716,252

DUAL POSITION HYDRAULIC OUTRIGGER ASSEMBLY

LeRoy J. Johnson, Fayetteville, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed March 1, 1971, Ser. No. 119,502
Int. Cl. B60s 9/12
U.S. Cl. 280—150.5 10 Claims



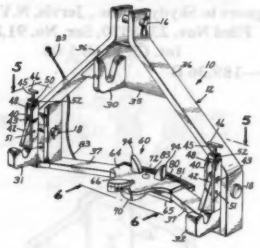
A hydraulic outrigger assembly for mobile cranes wherein the outriggers are constructed and arranged to be selectively extended to operative position in either a divergent or substantially vertical attitude relative to the vehicle being stabilized.

3,716,253

TRACTOR HITCH APPARATUS

Glenn D. Gniffke, and Harold A. Fratzke, both of Cottonwood, Minn., assignors to Metro Hydraulics Inc., Minneapolis, Minn.

Filed Jan. 27, 1971, Ser. No. 110,119
Int. Cl. B60d 1/00
U.S. Cl. 280—415 A 6 Claims



Tractor hitch apparatus including an automatic three-point hitch and a self-hooking draw-bar hitch is described. The hitch apparatus is adapted for attachment to a conventional three-point tractor hitch system.

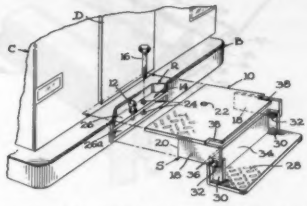
3,716,254

DETACHABLE FOLDING CAMPER STEPS

Edward M. Tarvin, Route No. 1 Box 74A, Terra Bella, Calif.

Filed Jan. 29, 1971, Ser. No. 111,030
Int. Cl. B60r 3/02
U.S. Cl. 280—166 17 Claims

A detachable pair of folding steps for use with a rear bumper of a camper vehicle and attachable thereto so that the top step is supported on and projects substantially coextensively beyond the bumper's upper horizontal surface by use of the conventional drop-in hitch pin as provided with many such bumpers, and which pin passes through an aperture customarily provided in alignment with the hitch pin. The lower step is foldable about pivot bolts in the upper portions of oppositely spaced brackets affixed thereto and is connected with complementally disposed side brackets affixed to and depending from the rearward underside of the top step. The top step plate is notched at its rearwardmost, laterally opposite sides to complementally receive, in a light friction fit manner, the side brackets of the lower step when folded up into overlying condition with the tread surface thereof laying face down on the face-up tread surface of the upper step. A riser plate is affixed to the rearward edge of the lower step and its side



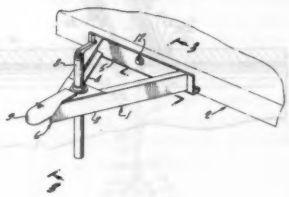
brackets, as viewed when facing said steps for use, and is of at least the same lateral extent as the outside span of the upper step's side brackets. The riser plate is notched out at its opposite outer and upper ends just sufficiently to complementally receive the upper brackets and to provide suitable support for holding the lower step in its unfolded horizontal use condition. The respective pairs of pivotally connected side brackets are of a height approximating slightly more than about one-half the overall riser height so that the lower step will fold over and rest upon the upper step when not in use.

3,716,255

REMOVABLE TRAILER HITCH

Billy R. Morris, 2538 Northmoor Drive, Corona, Calif.

Filed May 14, 1971, Ser. No. 143,322
Int. Cl. B60d 1/16
U.S. Cl. 280—491 E 10 Claims



An easily removable trailer hitch which provides for the uniform distribution of the loading forces over the entire length of the transverse horizontal member.

3,716,256

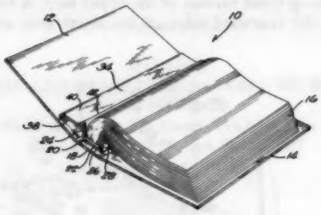
BOOK BINDING

Oliver K. Moore, Greenfield, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed May 25, 1970, Ser. No. 40,061
Int. Cl. B42d 3/00
U.S. Cl. 281—29 3 Claims

A front and back cover are hingedly connected to the backbone permitting the covers to be opened towards a planar position. A generally U-shaped binder is affixed to the interior of the backbone for receipt of the pages or leaves. A foldable

strip is connected between the front cover and binder which limits opening movement of the front cover relative to the backbone and binder over a preselected arc. Further opening movement of the front cover results in joint rotational move-



ment of the binder and backbone with the cover. The front cover is prevented from becoming coplanar with the backbone thereby reducing the amount of rotation of the pages as they are turned and providing a relaxed and stable paging of the book.

3,716,257

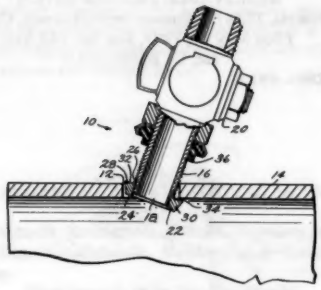
PUSH-IN FITTING FOR PLASTIC PIPE

Frank C. Hackman, and Robert R. Roos, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed March 15, 1971, Ser. No. 124,056

Int. Cl. F16l *5/02*

U.S. Cl. 285—210 **7 Claims**



A fitting is provided for establishing a fluid connection with a main, the fitting being of the type having a tubular member with a through bore and a collar secured at one end thereof; the collar is formed with diametrically extending ears, the overall dimension of which is greater than the aperture in the main through which the fitting is to be inserted; the exterior of the tubular member is threaded and carries a threaded nut and an annular gasket and centering ring; the radial thickness of the ring is such that it is substantially equal to the difference between the radius of the aperture in the main and the exterior radius of the tubular member so that when the fitting is disposed in the aperture of the main the centering ring will function to dispose the tubular element concentrically with respect to the aperture; the annular gasket is provided with a depending neck portion of a thickness substantially equal to the thickness of the centering ring so as to completely occupy the space between the wall of the aperture and the exterior surface of the tubular fitting.

3,716,258

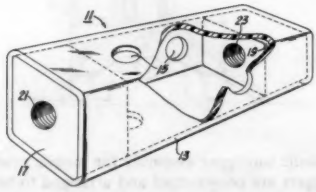
TURNBUCKLE BODY

Henry F. Lange, 24 Merion Road, Cherry Hill, N.J. 08034, and Stuart L. Adler, 1 Dorchester Drive, Apt. 602, Pittsburgh, Pa. 15241

Filed Jan. 20, 1971, Ser. No. 108,083

Int. Cl. F16b *7/06*

U.S. Cl. 287—60 **1 Claim**



A length of fiber reinforced plastic tubing, which may have a round, square or rectangular cross section, is plugged at both ends by axially threaded blocks that are fixed in the end portions of the plastic tubing. The tubing has a plurality of perforations in it and the blocks are right and left hand threaded.

3,716,259

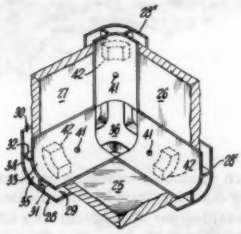
BONDED CONSTRUCTION

Robert L. Weill, and George B. Parsons, both of Port Jervis, N.Y., assignors to Skydyne, Inc., Jervis, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,819

Int. Cl. F16b *5/00*

U.S. Cl. 287—189.36 D **21 Claims**

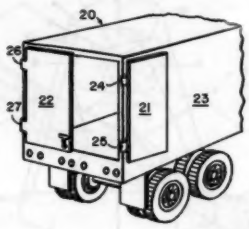


The invention contemplates a bonded assembly of plural parts having regions of channel-socket or telescoping fit with each other. One or more small apertures are provided to vent the overlap region of such fit, and the aperture assists in the pressurized liquid-phase introduction of hardenable bonding material. Depending upon the nature of the assembly or joint, (a) the parts may be fabricated to naturally and substantially close or dam the open annulus attributable to clearance between the overlapped parts at the open end of the region of overlap, or (b) expendable rings or solid plugs may be used to confine to the overlap region the flow of injected bonding material. After such injection and flow, the bonding material is cured to hardness.

3,716,260
HOLD-OPEN LATCH

Robert J. Herlein, Box 1172, Route 1, Custer, Mich.

Filed March 4, 1971, Ser. No. 120,808
Int. Cl. E05c 19/10
U.S. Cl. 292—103 5 Claims

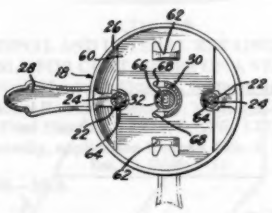


A latch having a keeper housing provided with a resilient pad to cushion the engagement of the latch hook, and hold it in engagement with the keeper.

3,716,261
ANTI-VIOLATION MEANS FOR LEVER ACTUATED LATCH

John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.

Filed Aug. 19, 1970, Ser. No. 65,079
Int. Cl. E05c 13/00
U.S. Cl. 292—169.23 2 Claims



A usual longitudinally extending latch unit has a longitudinally reciprocal bolt and stationary frame parts are spaced transversely of the latch unit at opposite sides thereof mounting a half round spindle extending from one frame part through the latch unit to the other frame part. The frame parts mount the spindle for limited rotational movement from a normal intermediate non-operating position in either rotational direction to opposite operating positions, the spindle being operably connected with the bolt positioning the bolt extended in spindle normal non-operating position and retracted in either of the spindle operating positions. An anti-violation plate is mounted stationary on one of the frame parts by slidable engagement with spaced lugs on said frame part and telescopes the spindle spaced between that frame part spindle rotational mounting and the latch unit. The spindle extends through a plate opening having spaced abutment surfaces on the plate bordering said opening positioned engageable by the spindle when the spindle is moved to either of its operating positions, but the plate otherwise remaining free of contact with the spindle. The anti-violation plate thereby retains the spindle and bolt against movement in excess of that intended.

3,716,262
CONCEALED LATCHING MECHANISM

Chester H. Wickenberg, 164 Division Street, Elgin, Ill.

Filed April 29, 1971, Ser. No. 138,484
Int. Cl. H01r 3/14
U.S. Cl. 292—218 6 Claims

A self-operating concealed latching mechanism for releasably securing separate portions of a container, such as luggage and the like, together, having a concealed latching rod and catches so constructed as to provide an intermediate latched position that facilitates complete closing and locking of the separate portions together and which prevents accidental separation thereof.

3,716,263
REFUSE COLLECTION DEVICE

Alfred C. Gatti, 2152 E. 18th St., Brooklyn, N.Y. 11219

Filed Feb. 9, 1972, Ser. No. 224,665
Int. Cl. A47f 13/06
U.S. Cl. 294—19 R 7 Claims

A pair of scoops are pivotably mounted upon supporting arms affixed to a vertically adjustable shaft and handle, the scoops being maintained in an open position by springs biasing the scoops against plungers. When the scoops are in contact with the ground or other surface from which refuse is to be removed, the handle is depressed, thereby urging the scoops to a closed position where they are maintained by means of the plungers which are then permitted to descend so as to obstruct retraction of the scoops to their open position. A bag may be disposed around the scoops during these operations so as to enclose the refuse sought to be removed,

the bag thereafter being discardable or otherwise disposable as desired.

3,716,264

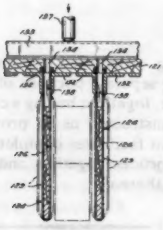
INFLATABLE GRIPPERS FOR BRICK MAKING MACHINES OR THE LIKE

Florentin J. Pearne, Whittier; Frank S. Pearne, San Gabriel, and Frederick G. Robson, Long Beach, all of Calif., assignors to Aircraft Mechanics, Inc., Los Angeles, Calif.

Division of Ser. No. 850,849, Aug. 18, 1969, Division of Ser. No. 478,913, Aug. 11, 1965, Pat. No. 3,478,397, and a continuation-in-part of Ser. No. 478,913, Aug. 11, 1965, Pat. No. 3,478,397. This application March 8, 1971, Ser. No. 122,005

Int. Cl. B66c *1/46*

U.S. Cl. 294—63 A **8 Claims**



An automated brick hacker is disclosed which includes an inverter stacker operable to position one elongated cut or uncut slug of unfired brick material on a subsequent cut or uncut slug. In one embodiment, an inverter is pivoted for movement between a position aligned with an off-bearing belt and an inverted position over the belt. A pusher operates to slide alternate slugs from the off-bearing belt onto the inverter. Vacuum means grip the slug while it is inverted and positioned over the subsequent slug on the off-bearing belt. In another embodiment, an inverter stacker is provided which is operable to grip lateral sides of a slug along its length and raise the slug for positioning on a subsequent slug with or without inversion. A pusher drivingly engages the rearward end of a cut slug for movement into the inverter and spaces adjacent slugs without creating spaces between bricks in the slug. A pneumatic gripper is provided to gently, but securely, grip a plurality of bricks for transfer from one location to another.

3,716,265

GRAB

Leendert van Hunksloot, Rotterdam, Netherlands, assignor to Nemag N.V., Rotterdam, Netherlands

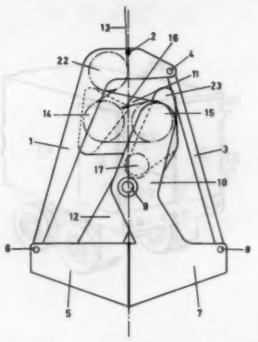
Continuation of application Ser. No. 640,635, May 23, 1967. This application Mar. 27, 1970, Ser. No. 20,877

Claims priority, application Netherlands, May 26, 1966, 6607301

Int. Cl. B66c *3/10*

U.S. Cl. 294—70 **1 Claim**

A grab having a carrier with two mutually pivoted containers. The side plates of the containers are elongated beyond their fulcrum and means are provided at their ends for leading the controlling cable or cables. The side plates are almost in a direct line with the closing edges of the grab containers and beyond the fulcrum are staggered so that they may pass each other. The ends of the side plates supporting the rollers for leading the controlling cable when in opened position of the grab are almost in the same horizontal plane as the pivot of the grab containers. The ends of the side plates of one of the



grab containers supporting bypass rollers of the controlling cable form an angle of about 90° with respect to the remaining portion of the side plates.

3,716,266

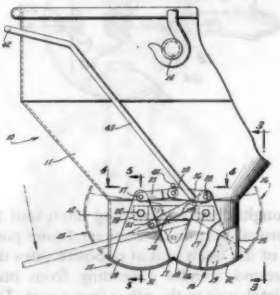
CLAM SHELL GATE ACTION

Leslie H. Garlinghouse, Pasadena, Calif., assignor to Garlinghouse Brothers, Los Angeles, Calif.

Filed Dec. 7, 1971, Ser. No. 205,511

Int. Cl. B66c *3/00;* **E21b** *33/132*

U.S. Cl. 294—71 **12 Claims**



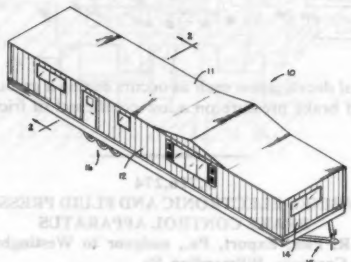
In a concrete placing bucket at the bottom of which is a chute is a pair of clam shell gates pivotally mounted on the bucket so that they can be simultaneously swung outwardly to open the chute and release the contents of the bucket. To open the gates a handle is swung downwardly by hand and an actuator arm and synchronizer link mechanism multiplies the manual force to swing the gates open. Two actuator arms are pivotally attached together and when moved downwardly pull upper ends of the gates toward each other to swing lower ends of the gates away from each other. A synchronizer link attached to one gate above the pivot point and to the other gate below the pivot point forces the gates to move at approximately equal rates over approximately equal opening distances.

3,716,267

UNIFIED FLOOR-FRAME ASSEMBLY WITH SKIRT FOR A MOBILE BUILDING

Frederick H. Lindsay, Rt. 1, Dunkirk, Ind.

Filed Nov. 8, 1971, Ser. No. 196,597
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 R 6 Claims



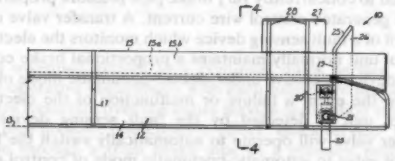
A unified floor and frame assembly with a skirt for a mobile building. The floor and frame assembly has a pair of parallel I-beams which extend the length of the building being mounted atop a plurality of parallel beams extending the width of the building. A plurality of parallel members aligned with the lower beams are mounted atop the pair of beams and are supported by vertical legs. Floor sheets are mounted atop a plurality of ribs which extend the length of the building being recessed in the members. The lower beams form ledges which receive and support the building side walls. A wheeled carriage is removably connected to tubes mounted beneath the floor-frame assembly for transportation of the building. Skirts are fastened to the building side walls and extend to the bottom end of the unified floor-frame assembly.

3,716,268

LONGITUDINAL AND LATERAL RETAINER AND GUIDE ASSEMBLY FOR CONTAINERS ON A VEHICLE BED

Kelly J. Arrey, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Filed March 23, 1971, Ser. No. 127,160
Claims priority, application Canada, Feb. 4, 1971, 104514
Int. Cl. B60p *7/10*
U.S. Cl. 296—35 A 1 Claim



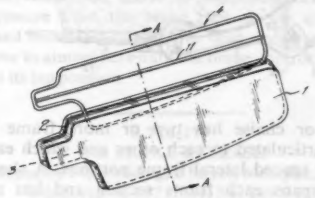
A bolster extending tranversely on a flat vehicle bed is provided at one side with an upstanding flange which engages the end of a shipping container resting on the bolster, so as to prevent movement of the container longitudinally and transversely of the bed. A vertical side plate on each end portion of the bolster projects upwardly to engage a side of the container and prevent movement thereof transversely of the bed. The side plate has an upwardly and outwardly slanting upper portion, and an upwardly and outwardly slanting end plate is secured to the bolster above the flange. The slanted upper portion of the side plate and the slanted end plate provide sloping guides for a container which is loaded from overhead onto the bolster.

3,716,269

SUNVISOR, ESPECIALLY FOR MOTOR DRIVEN VEHICLES

Gerhard Herr, Wuppertal-Elberfeld, and Willy O. Treber, Wuppertal-Vohwinkel, both of Germany, assignors to Gebr. Happich GmbH

Filed April 28, 1970, Ser. No. 32,607
Claims priority, application Germany, May 28, 1969, P 19 27 020.3
Int. Cl. B60j *3/00*
U.S. Cl. 296—97 H 4 Claims



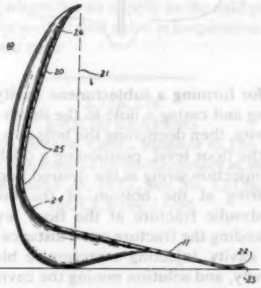
A padded sunvisor for motor vehicles is formed of two layers of material joined along all but one border to form a pocket into which is slipped a correspondingly shaped inner stiffening member, which may be formed of a strong wire frame. After insert of the stiffening member, the slit opening in the visor is closed to surround the stiffening member. Individual sunvisors may be cut from a long rectangular block of material with a stiffening member inserted into the pocket space of each section.

3,716,270

BACK SUPPORT

Richard B. Frazier, Burlington, Vt., assignor to Calcagni-Frazier-Zajchowski, Architects, Inc., Burlington, Vt.

Filed July 14, 1971, Ser. No. 162,410
Int. Cl. A47c *4/02, 7/02;* B60n *1/06, 1/10*
U.S. Cl. 297—377 1 Claim

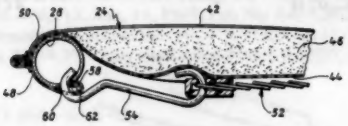


A back support, single piece, fiber reinforced plastic, or moulded high-impact un-reinforced plastic, molded to shape, to support the back of an individual, child, adolescent, or adult, the form being an upwardly extending back support portion integrally a part of a generally horizontal portion adapted to rest on the floor and engage the floor, the force of the individual's back pressing against the upwardly extending support, being transmitted to predetermined symmetrically placed areas of the horizontally outwardly extending base portion. The device is suitable for use as a back rest by an individual sitting on the floor, whether it be the bare floor or the floor with a small flat cushion.

3,716,271
FOLDING-FURNITURE PIECE

Rudolf Kurz, Bissingen, Germany, assignor to Firma Kurz GmbH, Bietigheim Wurtt., Germany

Filed Jan. 27, 1971, Ser. No. 110,207
Claims priority, application Germany, Feb. 6, 1970, G 70 04 114.4
Int. Cl. A47c 7/28
U.S. Cl. 297—457 8 Claims

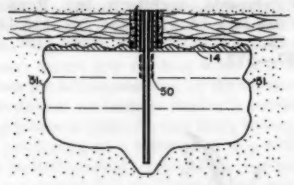


A chair or chaise has two or more frame sections which are articulated to each other and which each have transversely spaced lateral frame portions. A sheet material cover spans each frame section and has marginal portions which at least in part embrace the respective lateral frame portions, with springs spanning the frame sections at a side opposite that where the respective cover is located and engaging the marginal portions of the cover to pull the cover taut.

3,716,272
METHOD OF CREATING LARGE DIAMETER CYLINDRICAL CAVITIES BY SOLUTION MINING

J. Gilbert Davis, II, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 24, 1971, Ser. No. 148,255
Int. Cl. E21b 43/28
U.S. Cl. 299—5 3 Claims



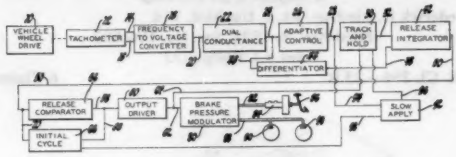
A method for forming a subterranean cavity including the steps of drilling and casing a hole to the depth desired for the roof of the cavity, then deepening the hole to a depth to about 4 feet below the floor level, positioning a dual string of wash pipe with the injection string at the desired floor level and the production string at the bottom of the hole, creating a horizontal hydraulic fracture at the floor level using fresh water and extending the fracture out a distance desired for the radius of the cavity, injecting a protective blanket over the roof of the cavity, and solution mining the cavity in incremental stages, maintaining the protective blanket for each incremental stage.

3,716,273
VARIABLE SENSITIVITY ANTI-LOCK BRAKE CONTROL

David G. Beyerlein, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1970, Ser. No. 42,304
Int. Cl. B60t 8/12
U.S. Cl. 303—21 CG 4 Claims

The control includes a reference signal with which braked wheel deceleration is compared for sensing incipient wheel lock-up and a circuit responsive to the rate of change of deceleration for changing the reference signal to make the control more or less sensitive to deceleration. The circuit is so arranged that the sensitivity is increased at a low rate of

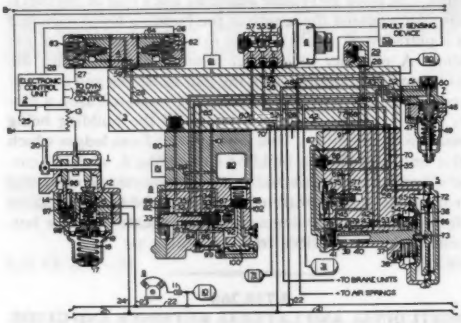


change of deceleration such as occurs during a gradual application of brake pressure on a low coefficient of friction surface.

3,716,274
COMBINED ELECTRONIC AND FLUID PRESSURE BRAKE CONTROL APPARATUS

Jerome R. Pier, Export, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 28, 1971, Ser. No. 184,346
Int. Cl. B60t 15/18
U.S. Cl. 303—20 7 Claims



A rapid transit type railway brake control system in which an electronic control unit is employed to normally regulate electro-pneumatic control of the friction brakes in a manner to continuously supplement the effective dynamic brake sufficient to satisfy the brake demand input. Flow of electric current in a control wire (P-wire) to the electronic control unit is selectively varied to provide the desired braking in accordance with operation of a controller device which is adapted to concurrently vary brake pipe pressure proportional to the generated control wire current. A transfer valve under control of a fault sensing device which monitors the electronic control unit normally maintains a proportional brake control valve device operative under electro-pneumatic mode of control. In the event a failure or malfunction of the electronic control unit is detected by the fault sensing device, the transfer valve will operate to automatically switch the brake control valve to automatic-pneumatic mode of control under the influence of brake pipe fluid pressure.

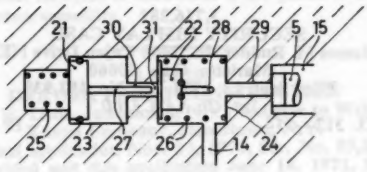
3,716,275
ANTI-LOCK BRAKE SYSTEMS FOR WHEELED VEHICLES

Derek Robert Skoyles, East Grinstead, England, assignor to U.S. Philips Corp.

Filed March 5, 1971, Ser. No. 121,386
Claims priority, application Great Britain, March 18, 1970, 13,146/70
Int. Cl. B60t 8/00, 17/18
U.S. Cl. 303—21 AF 4 Claims

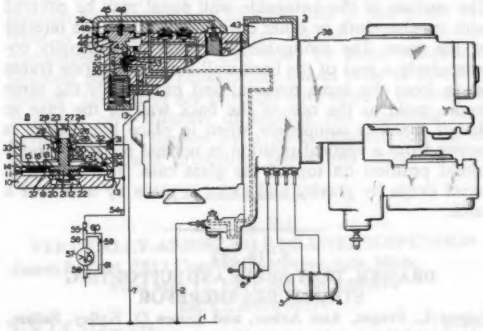
An anti-lock hydraulic brake system having a fluid pressure line connected to the anti-lock control valve. Actuation of the

control valve causes displacement of fluid through the valve to relieve brake pressure. A fail-safe arrangement as provided for



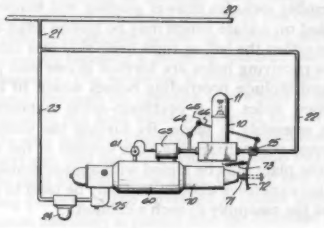
cutting off the flow when prolonged actuation of the control valve occurs.

3,716,276
QUICK SERVICE VALVE DEVICE
Richard L. Wilson, Monroeville, and Daniel G. Scott, Apollo, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 27, 1971, Ser. No. 193,106
Int. Cl. B60t *17/04*
U.S. Cl. 303—82 **16 Claims**



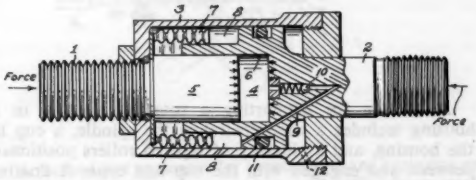
This invention relates to a continual quick service valve device operative sequentially with each successive brake pipe pressure reduction over the entire service application range of brake pipe pressure reductions to effect "quick service" transmission through a train brake pipe of a pressure reduction wave. Fluid under pressure heretofore released from the quick action chamber of a conventional brake control valve device to atmosphere upon effecting a service reduction of brake pipe pressure is supplied to one side of an abutment to cause it to open a quick service valve that establishes a communication between the train brake pipe and a quick service volume. This abutment also constitutes a snap-acting valve for controlling flow between the quick service volume and atmosphere and simultaneously effecting a change in its effective area. Consequently, so long as the one side of this abutment is subject to fluid under pressure released from the quick action chamber, it successively deflects in opposite directions to operate the quick service valve for controlling flow from the train brake pipe to the quick service volume and simultaneously, acting as a valve, repeatedly first cuts off flow from the quick service volume to atmosphere and thereafter releases to atmosphere the fluid under pressure supplied to this volume from the train brake pipe. Means are provided for constantly releasing to atmosphere at a restricted rate the fluid under pressure supplied to the one side of the abutment so that upon movement of the brake control valve device from its service to its lap position, the repeated operations of the continual quick service valve device are terminated. However, upon any subsequent movement of the brake control valve device from its lap position to its service position in response to a manually effected further reduction of brake pipe pressure, this continual quick service valve device will operate in the manner described above to repeatedly first vent fluid under pressure from the brake pipe to the quick service volume and thereafter release this fluid under pressure from this volume to atmosphere until the brake control valve device returns to its lap position.

3,716,277
AIR BRAKE RELEASE
Harvey Stephens, 1435 Michigan Street, Memphis, Tenn.
Filed Aug. 9, 1971, Ser. No. 169,912
Int. Cl. B60t *15/22*
U.S. Cl. 303—70 **4 Claims**



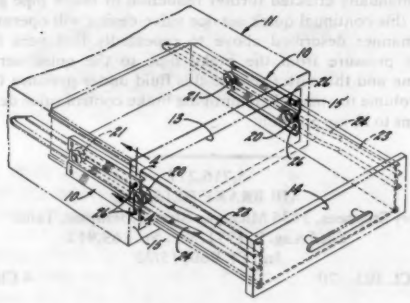
Apparatus for the release of railroad air brakes, which consists of a pressure sensitive control valve which supplies air to a piston to bleed the air brake reservoir, and thus release set brakes, together with valving sensitive to the position of the air brakes which controls the air supply to the said pressure sensitive control valve so that said valve is inoperative when brakes are in the released state.

3,716,278
LIQUID BEARING
George N. Depew, Reseda, Calif., assignor to The United States of America as represented by the Secretary of the Army
Filed March 25, 1971, Ser. No. 127,869
Int. Cl. F16c *17/06*
U.S. Cl. 308—9 **5 Claims**



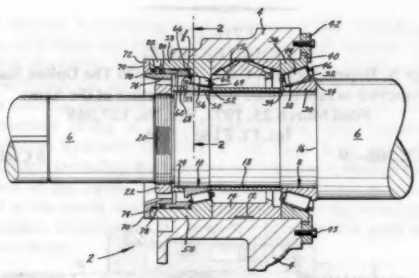
A liquid thrust bearing has provision for minimizing leakage, automatically returning leakage to a reservoir, and automatically restoring any lost fluid to the pressure/thrust area each time the thrust is removed.

3,716,279
UNIVERSAL ROLLER BRACKET ASSEMBLY FOR DRAWERS
Lloyd L. Anderson, and Richard L. Bildahl, both of Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed July 6, 1971, Ser. No. 159,727
Int. Cl. F16c *29/00*
U.S. Cl. 308—3.8 **6 Claims**



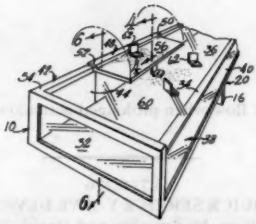
The assembly includes drawer guiding and supporting rollers journaled on a plate which may be turned edge-over-edge and used at either the left or right hand side of a cabinet. Circular screw-receiving holes are formed in one end portion of the plate and include protruding bosses which fit into accurately formed holes in a precision-made cabinet to help anchor the assembly in place. By turning the plate end-for-end, elongated screw-receiving slots formed in the other end portion of the plate may be alined with approximately-located holes in a less expensive cabinet and may be used to enable attachment of the assembly to such a cabinet.

3,716,280
BEARING CONSTRUCTION WITH PRELOAD COMPENSATION
Robert Lee Leibensperger and Glen Ray Norris, Canton, Ohio, assignors to The Timken Company, Canton, Ohio
Filed Dec. 20, 1971, Ser. No. 210,042
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 A **13 Claims**



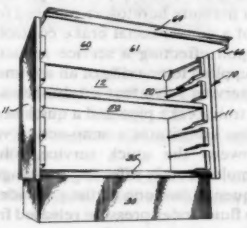
A bearing for supporting a rotatable spindle in a housing includes a cone encircling the spindle, a cup in the housing, and a plurality of tapered rollers positioned between and engaged with the cup and cone. A floating rib ring bears against the large diameter end faces of the rollers adjacent to the cup, and this rib ring is housed in a rib ring carrier. Connected with the carrier is rib positioning means for maintaining a substantially constant force on the rib ring so that the preload of the bearing does not vary from a selected set point as the bearing and the surrounding structure experienced differential thermal expansion. The positioning means may be adjusted to another set point while the spindle is rotating, in which case it imparts another substantially constant force to the rib ring and that force corresponds to the new set point.

3,716,281
SECURITY DISPLAY CASE
James M. Rudder, Jr., 2448 Cajun Drive NE., Marietta, Ga. 30060
Filed Sept. 23, 1971, Ser. No. 182,939
Int. Cl. A47f *3/00*
U.S. Cl. 312—114 **10 Claims**



A portion of the back wall of a jewelry display case behind the counter is a swingably mounted wall panel so that expensive jewelry items such as rings, bracelets, and watches are placed on the surface of the swingable wall panel when it rests on top of the counter leaving a large exposed opening to the case behind the counter. The surface of the swingable wall panel may be covered with jewelry cloth or other covering to match the interior of the case. The swingable wall panel is normally coextensively a part of the back wall but is a separate frame made from the same material and has exactly the same frame mold as the rest of the back wall of the case so that it matches completely when in place but readily is swung from a vertical position in normal place to a horizontal position on top of the glass case. The swingable panel drops by gravity and locks in place by means of a latch.

3,716,282
DRAWER, TRAY-SHELF AND SUPPORTING STRUCTURES THEREFOR
Robert L. Propst, Ann Arbor, and James O. Kelley, Saline, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Oct. 12, 1970, Ser. No. 79,890
Int. Cl. A47b *88/16*
U.S. Cl. 312—322 **2 Claims**



A mobile drawer supporting frame with a back and sides is molded of a temperature resistant, impact resistant plastic. In-

tegrally molded drawer guides include drawer seating recesses which cooperate with drawer glides on molded plastic drawers to insure that the drawers are seated against accidental opening during movement of the frame. The molded plastic drawers are stackable, as are molded plastic shelf-trays which also can be supported in the drawer guides. The shelf-trays are invertible to provide either a shelf or a tray, and can be inserted either forwards or backwards in the guides to thereby increase their versatility.

3,716,283

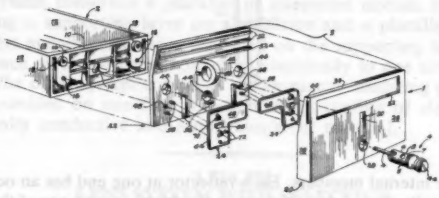
DRAWER FRONT CONSTRUCTION

Carl H. Little, Jamestown, N.Y., assignor to Weber Knapp Company, Jamestown, N.Y.

Original application Nov. 13, 1970, Ser. No. 89,312. Divided and this application June 18, 1971, Ser. No. 165,852

Int. Cl. A47b *88/00*

U.S. Cl. 312—330 **2 Claims**



A two part plastic front construction for library card drawers or the like, wherein a rear half of the front carries a tray pull or handle for projection forwardly through an opening in a forward half of the front. The front is mounted on and force applied to the tray pull transferred to the card tray body by metal reinforcing brackets positioned between the halves prior to assembly thereof. The halves are provided with aligned openings to receive a card follower or holding rod mounting latch device retained therein by a guide-retainer formed integrally with and projecting rearwardly from the rear half.

3,716,284

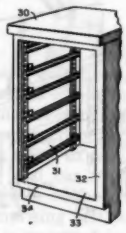
VERTICALLY-ADJUSTABLE DRAWER SUSPENSION

James B. Vogt, 7811 Consveration Drive, Ada, Mich.

Filed May 17, 1971, Ser. No. 144,090

Int. Cl. A47b *88/10*

U.S. Cl. 312—339 **7 Claims**



A track suspension for drawers and trays, the components being positioned vertically by apertured mounting strips installed at the four vertical corners of a cabinet space, together with brackets engageable at selected apertures in these strips. The rear brackets are engageable and disengageable in a direction other than tangential with respect to the front mounting strips, so that engagement of the front brackets locks the entire assembly in position.

3,716,285

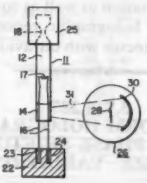
METHOD OF MANUFACTURING SUBMINIATURE ELECTRIC LAMPS

Walter A. Boyce, Glen Ridge, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 889,663, Dec. 31, 1969, Pat. No. 3,636,398. This application Aug. 18, 1971, Ser. No. 172,673

Int. Cl. H01j *9/38, 17/26*

U.S. Cl. 316—21 **6 Claims**



The lamp (which may be of the incandescent or photoflash type) has a composite envelope that is fabricated by sealing segments of light-transmitting and infrared-radiation absorbing glass tubing together in abutting relationship. The end of the infrared-radiation absorbing portion of the composite envelope is then hermetically sealed to the lead wires and the seal is formed by focusing a beam of infrared radiation onto the seal assembly. The envelope is evacuated, and filled with gas if desired, through its opposite end which is then tipped off. Oxidation of the lead wires is reduced to a minimum by forming the seal inside a chamber that is evacuated, or filled with an inert gas, and has walls which transmit infrared radiation. In the case of chamber-sealing, the free end of the light-transmitting portion of the envelope is sealed before the envelope-mount assembly is placed into the chamber so that the sealing and evacuation (or gas filling) operations are performed simultaneously.

3,716,286

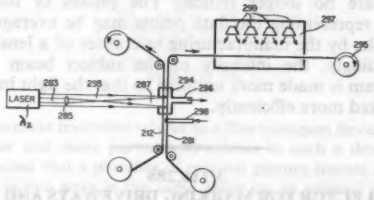
HOLOGRAPHIC TELEVISION RECORD SYSTEM

Daniel S. St. John, Hockessin, and Kenneth A. Haines, Middletown, both of Del., assignors to Holotron Corporation, Wilmington, Del.

Filed Dec. 11, 1969, Ser. No. 884,285

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **4 Claims**



A method and apparatus for constructing and replaying an optical holographic record containing a plurality of very small holograms, each of which contains information, independent of the other holograms. In the preferred embodiment described, each frame of an ordinary photographic movie is recorded as an individual hologram. The record is a narrow and elongated film with the holograms formed in a line along

its length, each hologram touching those on either side thereof. A moving image is reconstructed by drawing the record at a uniform speed through an effectively continuous wave coherent light beam. A light sensitive detector for converting an image into a time varying electronic signal is positioned to receive reconstructed sequence of images and transform it into a signal acceptable to an ordinary television set for displaying the movie thereon. Each hologram is constructed by passing a beam of a coherent light through a movie frame onto a much smaller hologram aperture and by interfering this beam at a finite angle with a reference wavefront having a radius of curvature substantially equal to the effective distance between the movie and the hologram. Methods of adding color visual information as well as sound information are also disclosed. Such a holographic record is copied onto a photopolymerizable detector with ultraviolet coherent light.

3,716,287

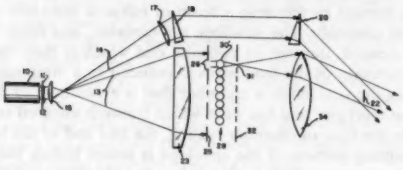
FOURIER TRANSFORM HOLOGRAPHIC MEMORY WITH RANDOM PHASE SHIFTING PRODUCED BY RANDOM SIZE VARIATIONS IN A LENS ARRAY

Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 4, 1971, Ser. No. 186,345

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **11 Claims**



A holographic system for recording data, particularly digital data. The data is represented by an array of light modulators such, for example, as an opaque sheet having apertures therein which represent the digital data. The openings in the opaque array or light modulators are illuminated by coherent light; they are relatively large so that they are less subject to closure due to dirt, or damage due to scratches. The resulting light beams passing the apertures are focused by an array of optical elements, each into a focal point, which are much smaller than the apertures. The optical elements may consist of spherical lenses or the like. The array of lenses determines the location of the focal points which are the data points. Accordingly, alignment tolerances of the opaque aperture sheet are no longer critical. The phases of the light waves representing the data points may be averaged, for example, by the manufacturing tolerances of a lens array. Accordingly, the intensity of the subject beam at the hologram is made more uniform so that the light intensity is utilized more efficiently.

3,716,288

REFLECTOR FOR MARKING DRIVEWAYS AND THE LIKE

Arnold H. Kannenberg, Germantown, Wis., assignor to Lemco Plastics Inc., Milwaukee, Wis.

Filed May 27, 1971, Ser. No. 147,435

Int. Cl. G02b *5/12*

U.S. Cl. 350—97 **7 Claims**

The reflector for marking driveways and the like is adapted to be resiliently clamped to a rod which can be inserted into the ground. One or more reflectors can be supported on the rod at various angles and reflect the lights of passing cars to mark, for example, the entrance to a driveway. Each reflector is constructed of a circular molded plastic frame to hold the reflecting plastic and has internal resilient members projecting inwardly from the frame which cooperate to securely clamp the reflector to the supporting rod which passes through aligned holes in the frame and a passage between the sprin-

glike internal members. Each reflector at one end has an octagonally shaped embossment on the frame around one of the holes in the frame, and a second embossment around the aligned hole at the opposite side of the frame which has an octagonally shaped inset. Thus, the embossment of one reflector can be seated in the inset embossment of an adjacent reflector to locate a respective reflector at four different angular positions on the supporting rod relative to an adjacent reflector.

3,716,289

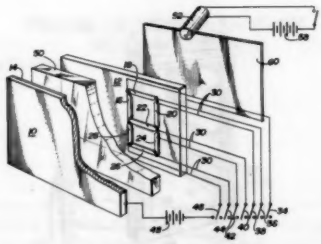
ELECTRO-OPTICAL DISPLAY DEVICES USING SMECTIC-NEMATIC LIQUID CRYSTAL MIXTURES

Linda T. Creagh, Argyle; Derick Jones, and Sun Lu, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1970, Ser. No. 68,280

Int. Cl. G02f *1/34*; C09k *3/00*

U.S. Cl. 350—160 LC **12 Claims**

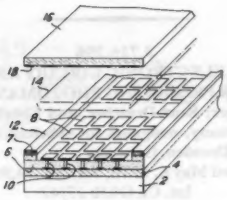


A display device includes a layer of a smectic-nematic liquid crystal composition that is normally transparent to light. The composition is effective to scatter light in response to a voltage applied thereacross. The smetic-nematic compositions exhibit the mesomorphic state through a broad temperature range that preferably includes room temperature.

3,716,290
LIQUID-CRYSTAL DISPLAY DEVICE

Joseph Borel, Echirolles, and Jacques Robert, Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 18, 1971, Ser. No. 190,178
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 8 Claims

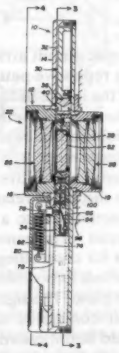


An electrooptical display device comprising a film of liquid crystals between two systems of electrodes. One system comprises a plurality of integrated circuits forming a supporting layer on a substrate and a plurality of flat metallic electrodes deposited on the supporting layer, each electrode being connected electrically to one circuit. The other system comprises a transparent insulating plate provided on one face with a uniform coating of electrically conductive and semi-transparent material.

3,716,291
LENS SYSTEM WITH SELECTIVE IMAGE REVERSION

Henry A. Giesecke, Oklahoma City, Okla., assignor to Apromat, Incorporated, Oklahoma City, Okla.

Filed Aug. 3, 1971, Ser. No. 168,624
Int. Cl. G02b 17/02
U.S. Cl. 350—203 15 Claims

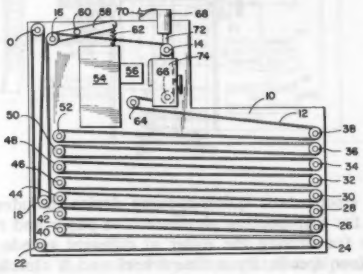


A lens system with selective image reversion includes a symmetrical objective lens system which is fixedly supported in a housing. A generally imperforate frame is mounted in the center cross section of the housing for reciprocation along a line extending between the elements of the lens system and has a pair of slots formed in it which extend the width of the lens system. An image reversion system comprising first, second and third external reflective surfaces is mounted in one of the slots of the frame and a transparent member having an index of refraction matched to the optical characteristics of the image reversion system is mounted in the other slot. The frame also supports a plate mounted for rotation to position either an imperforate portion or an *f*:16 aperture or an *f*:22 aperture in alignment with the transparent member. Structure is provided for normally positioning the transparent member in alignment with the lens system and for reciprocating the frame to scan the image reversion system through the lens system and thereby form an inverted image.

3,716,292
FILM ADVANCING DEVICE

Larry K. Long, Tempe, Ariz., assignor to Advance Management Engineering & Research Co., Phoenix, Ariz.

Filed Nov. 16, 1970, Ser. No. 89,602
Int. Cl. G03b 1/48, 21/14
U.S. Cl. 353—91 8 Claims



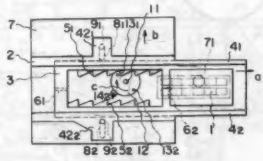
A film advancing device of the type used for advancing an endless film in single or multiple frame increments. The device includes a solenoid assembly and indexing plate which blanks out the film during its movement or drive and indexes the film in alignment with the projection lamp, as the desired frame is positioned.

The device is particularly adaptable to the programed advance of films, containing a plurality of questions which are projected for manual or computer answer by a student, medical patient, or the like.

3,716,293
FILM TRANSPORT DEVICE FOR A PROJECTOR

Naohiko Kitano; Akira Kamanaka; Mamoru Katsuragi; Tatsuo Kobayashi and Tadashi Iida, all of Osaka-fu, Japan., assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Japan

Filed Oct. 19, 1970, Ser. No. 82,018
Int. Cl. G03b 23/00, 23/08
U.S. Cl. 353—103 8 Claims



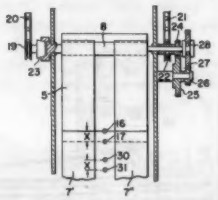
The present invention relates to a film transport device for a projector and more particularly relates to such a device so constructed that a plurality of original picture frames are arranged in two rows in the same plane on an original picture holding frame. By means of a driving device driven in one direction, said original picture holding frame is moved rectangularly so as to be delivered from one end of one of said two rows to the other end and at the extreme end thereof being moved in a perpendicular direction thereto. The frame is then delivered from one end of the other row to the other end in the opposite direction and at the extreme end thereof, being returned again to the perpendicular direction thereto. Thus, the original picture holding frame is rectangularly moved and thereby original picture frames are projected in turn.

3,716,294

ELECTROSTATIC QUICK COPYING APPARATUS

Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 8, 1970, Ser. No. 53,209
Claims priority, application Germany, July 10, 1969, P 19 35 025.5
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 11 Claims



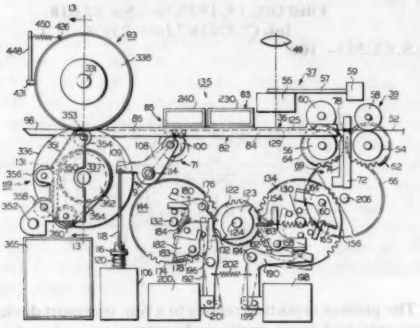
An electrostatic quick copying device includes a drive roller for transporting photosensitive paper and two drive means for driving the roller at different speeds, i.e. fast and slow speeds, by a free wheel and a clutch, respectively. At least a pair of switches is disposed in the path of the photosensitive paper for engaging and disengaging the clutch, whereby the photosensitive paper is slowly moved for a short time during exposure so as to enable the exposure to be accomplished by at least one xenon flash means.

3,716,295

ELECTROSTATIC MICRO COPYING APPARATUS INCLUDING FILM CUTTING, SLITTING, AND INSERTING MEANS FOR APERTURE CARDS

Yasutaka Nakajima; Isao Yamaguchi and Masaru Onoshi, all of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed March 12, 1971, Ser. No. 123,587
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 9 Claims



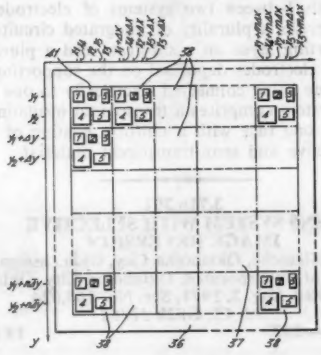
A photographic apparatus for producing a micro image of an original on an electrophotosensitive film by means of an electrophotographic method. The apparatus includes cutting means for cutting a length of film into film sections of a predetermined length, a supporting member for supporting and guiding said length of film and said film sections along a predetermined path, an aperture member having an aperture formed therein which defines the size of a frame on the film so as to leave two remaining portions at both longitudinal sides of the film, a charging means for charging electrostatically said frame, an exposure means for exposing the charged frame to a micro projected image of the original, a processing means for processing the exposed frame, an advancing means for advancing the film so that the film under driving engagement with only said two remaining portions of the film, a slitting means for separating said remaining portions from said film section after completion of the processing, and means for inserting the finished microfilm section into a pocket of an aperture card.

3,716,296

METHOD AND ELECTRONIC CIRCUIT ARRANGEMENT FOR PRODUCING PHOTOMASKS

Reinhard Springer; Kurt Drescher, and Eberhard Jahn, all of Dresden, Germany, assignors to Arbeitsstelle Fur Molekularelektronik, Dresden, Germany

Filed May 6, 1970, Ser. No. 34,961
Int. Cl. G03b *27/42*
U.S. Cl. 355—53 6 Claims



A method and electronic circuit arrangement for producing photomasks comprising repetitive patterns of any desired size regardless of the size of the image field of an optical projection system. According to the present method an orthogonal mask field is displaced to initial coordinates Xi, Yi relative to a fixed column and row coordinate system, a plurality of such mask fields, each having different repetitive patterns, are arranged on a photographic plate displaced relative to each other, such mask fields are then assembled into a complex pattern mask field. The present circuit arrangement comprises control signal generating means for controlling a tool such as an optical projection system as well as positioning means for said tool or for said photographic plate. The signal generating means include a spacing counter connected to preselector units adjustable for selecting said initial coordinates, said units being connected to logic circuit channels which identify the signals produced at the outputs of said preselector units to provide control signals for the optical projection system and for the positioning means.

3,716,297

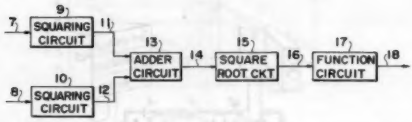
BRIGHTNESS COMPENSATING SYSTEM OF DISPLAY APPARATUS

Hajime Wakabayashi, Tokyo, Japan, assignor to Iwatsu Electric Company, Ltd., Tokyo, Japan

Filed Sept. 16, 1970, Ser. No. 72,599
Claims priority, application Japan, Sept. 26, 1969, 44/76438
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 4 Claims

In a display apparatus, e.g., a cathode ray tube, in which the image displayed by the apparatus is processed, e.g., photog-

raphed by a camera, a function circuit is provided to generate a brightness compensation voltage determined by the characteristics of the lens of the instantaneous deflection of the



cathode ray with the brightness compensation voltage is applied to the brightness adjuster associated with the deflection coils of the cathode ray tube.

3,716,298

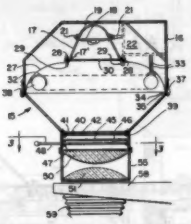
PHOTOGRAPHIC ENLARGER

Edward A. Reardon, 5183 Bohlig Rd., Los Angeles, Calif.

Filed July 14, 1970, Ser. No. 54,709

Int. Cl. G03b 27/76

U.S. Cl. 355—71 **13 Claims**



A photographic enlarger having an electronic discharge flash tube as the light source for making the exposure, there is additionally provided an auxiliary light source for permitting focusing. Color value filters and light attenuating elements in the form of polarizing material discs are also provided.

3,716,299

FRAME COUNT CUER FOR CONTINUOUS PHOTOGRAPHIC FILM PRINTER

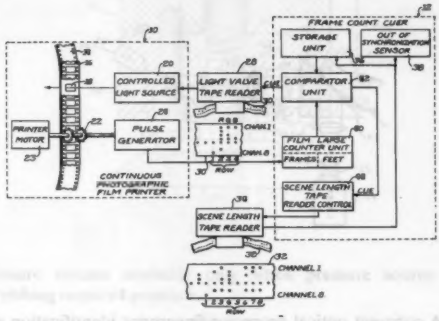
Andrew Balint, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 176,933

Int. Cl. G03b 27/78

U.S. Cl. 355—83 **16 Claims**

A frame count cuer for controlling the operation of a continuous photographic film printer. As the "preprint" film and overlaying "raw stock" are passed through the printer, a signal is generated corresponding to the quantity of film drawn across the exposure aperture. A counter is driven by the signal and provides a progressive integral footage and frame count of the amount of film passing through the printer. The information from a punched scene length tape is used to set a storage unit to the desired scene length and the setting of the storage unit is



compared with the counter by a comparator. Upon coincidence, a cue signal is fed from the comparator to the printer light valves. The light valves are preset with information obtained from a punched paper tape in accordance with a predetermined preferred light level and hue for the scene to be printed.

3,716,300

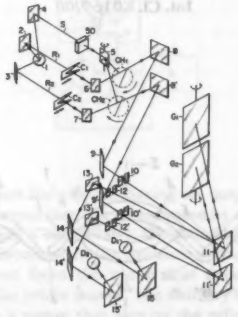
NULL BALANCE TRIPLE BEAM SPECTROPHOTOMETER

Koichi Matsumoto, and Makoto Ishikawa, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,608

Int. Cl. G01j 3/08, 3/42

U.S. Cl. 356—97 **9 Claims**

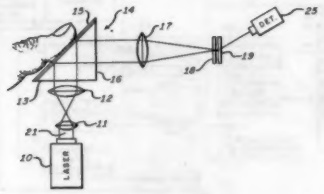


The beam modulating portion of a spectrophotometer has three beam paths, a first reference beam path, a second reference beam path, and a common sample beam path. The two reference beams are interrupted alternately by respective choppers which operate in synchronism and the sample beam is inserted into the respective interrupted periods of the two reference beams by a reflection mirror to provide two composite signals. The monochrometer portion of this spectrophotometer is a combination of two monochromators of the conventional type each receiving a respective composite signal.

3,716,301
FINGERPRINT IDENTIFICATION APPARATUS

Henry John Caulfield, Carlisle, and Dean Roger Perkins, Sudbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed March 17, 1971, Ser. No. 125,148
Int. Cl. G01b 9/08
U.S. Cl. 356—165 7 Claims

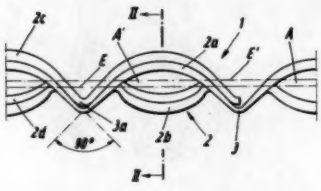


A coherent optical processor fingerprint identification apparatus in which identification is established by correlating an optical beam pattern representative of the finger to be identified with a prerecorded Fourier transform spatial filter of the fingerprint. Reliability of identification is improved by incorporating a mask in the processor so that the detector receives information primarily indicative of the correlation between certain features of the fingerprint and the spatial filter to the exclusion of other less significant features. Further improvement is achieved by means of dual detector affirmation-negation type signal processing techniques and, in the particular case of holographic filters various multiplexing techniques are also utilized for signal enhancement.

3,716,302
METHOD AND APPARATUS FOR BUILDING ROADS

Jean P. Bernold, CH-8880 Walenstadt, Switzerland, assignor to Hans Pfeiffer, a part interest

Division of Ser. No. 798,747, Feb. 12, 1969. This application Aug. 11, 1971, Ser. No. 170,771
Int. Cl. E01c 9/00
U.S. Cl. 94—4 7 Claims

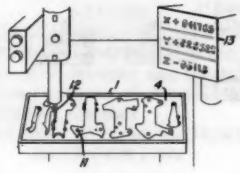


A method and apparatus for building roads including the steps of dipping special corrugated units into cold asphalt, arranging the dip coated units into a generally flat, planar continuous reinforcement, and pouring paving material over and through said reinforcement to establish a reinforced pavement.

3,716,303
EPOXY FIXTURING

Louis W. Rehberger, Baltimore, Md.; John C. Williams, Reston, Va., and John P. Demme, Joppatowne, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed July 1, 1970, Ser. No. 51,460
Int. Cl. B23b 39/08
U.S. Cl. 408—3 2 Claims

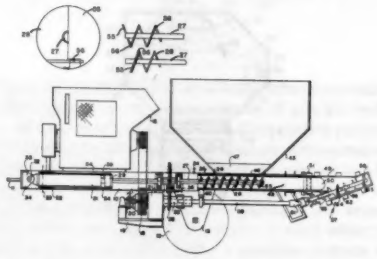


A system, means, and method for concurrently producing a plurality of different and irregular subcombinations by molding the subcombinations an an epoxy resin and numerical control machine processing the subcombinations.

3,716,304
CONCRETE PUMP

Manson Ivor Coles, Winnipeg, Manitoba, Canada, assignor to Mancole Company Limited, Winnipeg, Manitoba, Canada

Filed Sept. 14, 1970, Ser. No. 71,901
Int. Cl. F10b 3/00
U.S. Cl. 415—72 12 Claims



A pair of alternately reciprocal auger pumps fed by a common hopper and discharging concrete or the like into a common manifold. A clearance auger rotates considerably faster than the pump unit auger assemblies and clears the concrete from the manifold into the discharge conduit. Sections of the pump auger flights at the front ends thereof hinge to close off the ends when on the pumping stroke thus forming the auger flights into pistons.

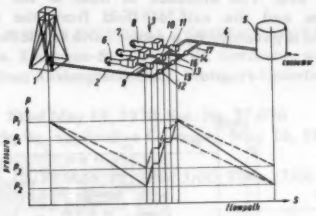
3,716,305
GAS TURBINE POWER PLANT

Georg Oberlander, Bensberg-Frankenforst, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Continuation of Ser. No. 622,730, March 13, 1967, abandoned. This application Aug. 20, 1970, Ser. No. 65,677
Claims priority, application Germany, March 15, 1966, K 58 727
Int. Cl. F04b 41/06
U.S. Cl. 417—2 1 Claim

The present invention relates to an arrangement of controlling a compressor station for a gaseous medium in which

the compressor station comprising turbine driven compressors is interposed between a source of a gaseous medium and a consumer. The compressors have associated therewith con-



trollable bypass conduit means so that the gaseous medium coming from the said source can selectively be passed through said compressors in succession or can bypass at least some of said compressors.

3,716,306

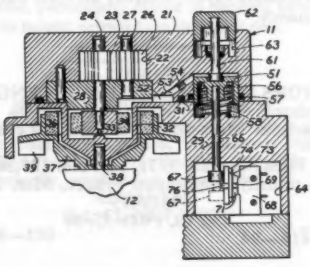
GEAR PUMP CONSTRUCTION

Thomas B. Martin, Sr., Danville, and Dickey S. Londahl, Walnut Creek, both of Calif., assignors to Micropump Corporation, Concord, Calif.

Filed March 31, 1971, Ser. No. 129,872

Int. Cl. F04b *49/02*

U.S. Cl. 417—44 **5 Claims**



A motor-driven gear pump used to pump fluid from a reservoir to a dispensing spigot has a cylinder connected to the pump discharge having a spring biased piston. The piston rod has a knob engaging a normally open microswitch controlling the motor. When the motor is running and the pump delivering through the spigot, the piston is in intermediate position and the knob maintains the switch closed. When the spigot is closed, back pressure builds up in the cylinder, forcing the piston to overcome the spring and the knob to move out of contact with the switch, stopping the motor. If the reservoir is empty, the cylinder empties and the spring moves the piston so that the knob moves out of contact with the switch, again stopping the motor as a safety precaution. Check valves are installed in the inlet line and discharge line of the pump. A manually actuated button moves the piston against the force of the spring and thus primes the pump and also closes the switch to start the motor.

3,716,307

VENTURI HEAD FOR VACUUM SYSTEMS

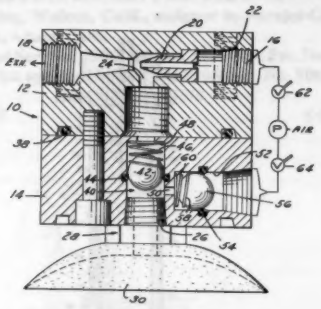
Richard R. Hansen, Roseville, Mich., assignor to KMS Industries, Inc., Ann Arbor, Mich.

Filed Oct. 6, 1971, Ser. No. 186,861

Int. Cl. A47b *97/00*; B66c *1/04*; A45d *42/14*

U.S. Cl. 417—191 **4 Claims**

A venturi-head for a vacuum system utilized as a source of negative pressure for vacuum cups and the like which has incorporated therein a safety shut off valve to hold vacuum in the vent of a failure of actuating jet stream and requiring a



pressure release available only when pressure source is furnishing required pressure.

3,716,308

HYDRAULIC SYSTEM

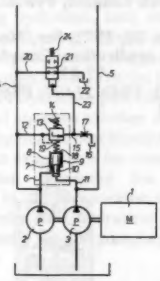
Walter Kobald, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 26, 1971, Ser. No. 109,813

Claims priority, application Germany, Jan. 28, 1970, P 20 03 740.5

Int. Cl. F04b *49/02*, *49/08*

U.S. Cl. 417—286 **7 Claims**



The user circuit for a pump having an output greater than the maximum output that can be accepted by the prime mover for the pump has a relief valve for shunting hydraulic fluid from the user circuit when the pressure within the circuit demands an output from the pump that exceeds the output available from the prime mover. The delivery side of the pump is connected to a piston that acts on the relief valve to open the latter in response to pressure within the user circuit.

3,716,309

SUBMERSIBLE MOTOR AND PUMP UNIT

Thomas O. Mitchell, Muskegon, Mich., assignor to Bennett Pump Incorporated, Muskegon, Mich.

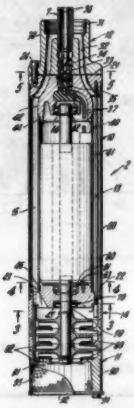
Filed May 13, 1971, Ser. No. 143,053

Int. Cl. F04b *17/04*

U.S. Cl. 417—422 **5 Claims**

A motor and pump unit adapted for submerged operations in a body of liquid such as gasoline comprises a cylindrical tube having mounted therein a hermetically sealed motor

which is operatively associated with a pump unit disposed at the lower end of the tube. The diameter of the motor is less than the inside diameter of the tube whereby fluid pumped by the pumping unit passes through the annular passageway



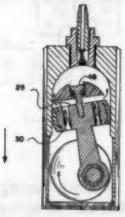
defined between the motor and the tube, and is conveyed to the conventional piping system of a gasoline dispensing unit. The motor is contained in a fully sealed housing with a lip seal being provided about the drive shaft of the motor to prevent gasoline from entering the motor.

3,716,310

DIRECT DRIVE BALL PISTON COMPRESSOR

William Dieter Guenther, London, Ontario, Canada, assignor to Gun Web Limited, Province of Ontario, Canada

Filed Jan. 20, 1971, Ser. No. 107,932
Claims priority, application Canada, Mar. 9, 1970, 77,033
Int. Cl. F04b *21/04*; F16j *1/00*
U.S. Cl. 417—552 **6 Claims**



A compressor including an essentially spheroidal piston having a biased spheroidal crown member acting as a valve and mating with a cupola shaped cylinder head.

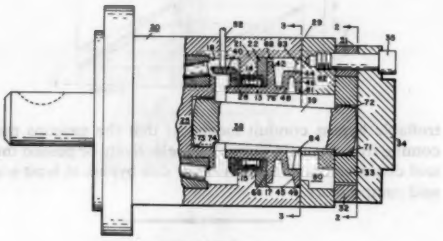
3,716,311

INDEPENDENT CONTROL MEANS FOR FLUID PRESSURE DEVICE

George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

Filed July 11, 1968, Ser. No. 744,135
Int. Cl. F01c *1/10*; F04c *1/06*
U.S. Cl. 418—61 **10 Claims**

An independent control means to govern the operation of a fluid pressure device having a stator element and a rotor element constituting a stator-rotor mechanism, in which the stator element has a fixed axis and in which the rotor element has a movable axis with said rotor element having a rotational movement about its own axis and an orbital movement about the fixed axis. The entrance of fluid to the stator-rotor mechanism and the exit of fluid from the stator-rotor mechanism is governed by a rotary valve in the fluid pressure



device.

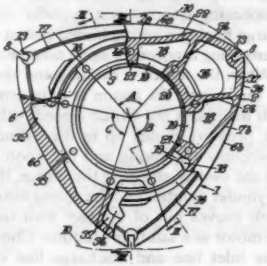
The independent control means features an actuating means for rotating the rotary valve independently of the rotor element by which the rotary valve is usually driven. The independent control means also features a by-pass valve which, when operated, fluidly interconnects the inlet and outlet ports of the fluid pressure device, whereby the rotor element may be stopped instantly.

3,716,312

ROTORS FOR ROTARY PISTON ENGINES

Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Levassor, Paris, France

Filed Mar. 23, 1971, Ser. No. 127,305
Claims priority, application France, Mar. 24, 1970, 7010479
Int. Cl. F02b *55/04*
U.S. Cl. 418—94 **5 Claims**



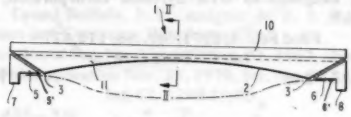
The rotor is constituted by a body with a curvilinear triangular profile and rotates in a casing of a trochoidal shape. The curvilinear faces of the rotor have central recesses bounded by transverse crests parallel to the axis of the rotor shaft and by peripheral crests practically perpendicular to this axis. These recesses form variable volume combustion chambers with the engine casing being separated from one another by seals mounted along the transverse crests. The chambers are isolated radially by lateral segments on the sides of the rotor cooperating with the lateral surfaces of the casing. Between the bot-

toms of the recesses and the bore are closed cavities; below the crests are cavities communicating with the cooling circuit.

3,716,313
ROTARY PISTON INTERNAL COMBUSTION ENGINE

Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed May 15, 1970, Ser. No. 37,676
Claims priority, application Germany, May 16, 1969, P 19 25 019.2
Int. Cl. F01c *19/02*; F03c *3/00*; F04c *27/00*
U.S. Cl. 418—121 17 Claims

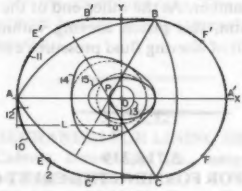


A rotary piston internal combustion engine especially of trochoidal construction with a piston that is provided at its corners with sealing bars which, for purposes of increasing the adaptability to the running surface of the casing, is constructed flexible, particularly elastic in bending by a selective reduction of its height, primarily in its center part.

3,716,314
ROTARY MOTION DEVICE

Koichi Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 10, 1971, Ser. No. 206,695
Claims priority, application Japan, Dec. 16, 1970, 45/112,735
Int. Cl. F04f *3/00*
U.S. Cl. 418—150 13 Claims

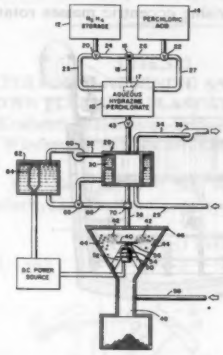


Herein proposed is an improved rotary motion device such as a rotary engine using a usually three-lobed rotor which rotates about its center and revolves around a center of a contoured chamber in a center housing. The chamber has an internal contour generated from a two-linked curve which is made up of a pair of symmetrical component curves joined together through straight or nearly straight segments so that the lobes of the rotor is permitted to pass through the junction points without change in sign of the acceleration at the lobe portions of the rotor as is encountered in the prior art rotary motion devices using an epitrochoidally contoured chamber. This will contribute to improving the sealing between the lobes and the contacting surface of the center housing while providing wide selection of the gear configurations.

3,716,315
NOVEL APPARATUS FOR THE PRODUCTION OF ANHYDROUS SPHERICAL AMMONIUM PERCHLORATE USEFUL IN ROCKET PROPELLANTS

William M. King, Walnut, Calif., assignor to Aerojet-General Corporation, Azusa, Calif.

Division of Ser. No. 253,522, Jan. 21, 1963, Pat. No. 3,520,743. This application Oct. 19, 1965, Ser. No. 506,418
Int. Cl. B22d *23/08*
U.S. Cl. 425—8 5 Claims



A method for the continuous production of substantially spherical anhydrous hydrazine perchlorate pellets by contacting a stream of molten anhydrous hydrazine perchlorate with the face of a rapidly spinning disk contained within a cone patent. The spherical anhydrous ammonium perchlorate is utilized as the oxidizer in solid propellant compositions. Apparatus for the continual production of the substantially spherical anhydrous hydrazine perchlorate comprises tank means for containing hydrazine, tank means for containing aqueous perchloric acid, means for containing an aqueous solution of hydrazine perchlorate, means for conveying said hydrazine and said perchloric acid to the means for containing an aqueous solution of hydrazine perchlorate, means for controlling the pH of said aqueous solution within said means for containing aqueous hydrazine perchlorate, means for conveying said solution to an evaporator for concentrating said solution and means for conveying the molten hydrazine perchlorate formed in the evaporator to a disk contained within a cone whereby said hydrazine perchlorate can be formed into substantially anhydrous spheres before impinging the sides of said cone.

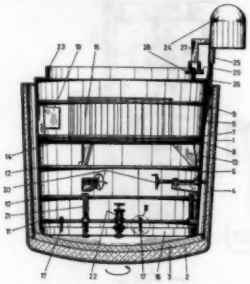
3,716,316
APPARATUS FOR THE APPLICATION OF A REFRACTORY LINING TO THE INSIDE WALL OF METALLURGICAL VESSELS, AS WELL AS A MOULDING UNIT TO BE UTILIZED IN COMBINATION THEREWITH

Cornelis Dekker, Ijmuiden; Pieter Karel Joustra, and Josephus Paro, both of Heemskerk, all of Netherlands, assignors to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V., Ijmuiden, Netherlands

Filed June 14, 1971, Ser. No. 152,668
Claims priority, application Netherlands, June 12, 1970, 7008651
Int. Cl. F27d *1/16*
U.S. Cl. 425—13 10 Claims

The apparatus comprises a sand slinging device for applying refractory lining in granular form, a molding unit temporarily

installed in and spaced from the vessel walls, and means for freeing the mold from the installed lining comprising vibration generators distributed around the inner periphery of the mold and hydraulic jacks, preferably removable, distributed about such periphery neat the bottom of the mold and expandable downwardly to raise the mold. A set of three jacks and a set of three vibrators are preferred, attached respectively to the lower and upper parts of a two-part mold. The preferred form also has manually operable jacks and centering spindles for the mold and at its bottom edges a cylindrical ring movable to sealingly engage the surface therebelow, an annular platform proximate to the top of the lower part of the mold, and vibration generators comprising eccentric masses rotatable about



vertical axis in different directions of rotation.

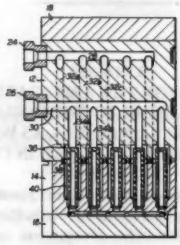
In the method, the lower part of the mold is positioned, raised free of the bottom of the vessel and centered and levelled by the manual jacks, with the ring resting on the vessel bottom; the platform and upper part of the mold are assembled on the lower part, the centering spindles are retracted; the refractory mass is slung into the space between the mold and the vessel walls; the hydraulic jacks are positioned at operative heights; the vibration generators and hydraulic jacks are operated and then stopped; the manual jacks are adjusted and the hydraulic jacks preferably removed and then the remaining mold parts. Concurrent and separate controls for the hydraulic jacks are preferably provided.

3,716,317

PACK FOR SPINNING HETEROFILAMENT FIBERS

Milton Guy Williams, Jr., and Henry Rausch, Jr., both of Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Filed April 1, 1971, Ser. No. 130,370
Int. Cl. D01d *3/00, 1/10*
U.S. Cl. 425—198 **9 Claims**



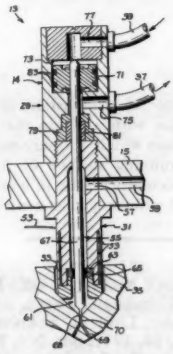
A spin pack is provided for producing heterofilaments from two polymer streams. Each stream is subdivided and the subdivisions filtered and delivered to a common header. The two headers are parallel and are defined between the upper face of a spinnerette and the adjacent members. Off each header and extending toward the other are a plurality of grooves, the grooves of one header alternating with those of the other and constituting pairs or couplets. Between each pair of grooves there are a plurality of channels of precise dimensions, e.g. length of at least about 0.075 inch, width of at least about 0.016 inch and depth of from about 0.005 to 0.030 inch, and a spinning orifice is located centrally of each channel. In this fashion each orifice gets the same amount of each polymer.

3,716,318

VALVING MEANS FOR INJECTION MOLDING APPARATUS

Carl L. Erik, Warren, and William J. Scott, Warminster, both of Pa., assignors to GTE Sylvania Incorporated, Secena Falls, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,627
Int. Cl. B29f *1/04*
U.S. Cl. 425—245 **7 Claims**



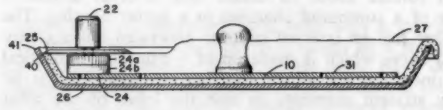
An improved valving means for an injection molding apparatus having first and second chambers located within a substantially cylindrically shaped body and separated by a restricting means. An elongated rod member, adapted to move within both chambers, has at one end a male tip which controls the amount of flow of molten material from the exit end of the first chamber. At the other end of the rod member is attached a piston, this piston moving within the second chamber as a result of altering fluid pressures exerted on both sides of the piston.

3,716,319

APPARATUS FOR FORMING THE CRUST OF A PIE

Harold E. Norman, Ponca City, Okla.

Filed April 20, 1970, Ser. No. 30,065
Int. Cl. A21c *11/10*
U.S. Cl. 425—293 **4 Claims**



A method for forming the crust of a pie, particularly a pizza pie, by rolling the crust to a predetermined thickness, placing the rolled crust over a pie pan, pressing the crust to the bottom of the pie pan by a disc-shaped platen, forming the sides of the pie by placing a contoured forming tool against the top of the disc-shaped platen and rolling the preformed roller around the

edge of the pie forcing the edge of the pie against the side of the pie pan. The pie is trimmed by having a second roller which contains a circular or disc knife. Thus the axis of the disc knife is parallel to the bottom of the pie pan and spaced a predetermined distance above the disc-shaped platen. The disc cutter is placed against the top of the platen in the same manner as the knife forming roller and rotated around the edge of the pie pan in a manner to trim the excess dough from the pie. The cut is made slightly below the top surface of the pan.

3,716,320

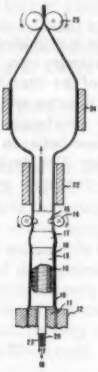
APPARATUS FOR PRODUCING FLAT FILM FROM THERMOPLASTIC MATERIAL

John B. Lyon, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 234,398, Oct. 31, 1962, abandoned. This application Nov. 23, 1970, Ser. No. 92,223

Int. Cl. B29d *23/00*

U.S. Cl. 425—326 **3 Claims**



An apparatus for producing flat film from thermoplastic material wherein an expandable cylindrical collar in combination with a pressure relief valve is positioned between the expansion area and the quenching area. The collar prevents the expansion gas from leaking into the quenching and extruding area of the apparatus.

3,716,321

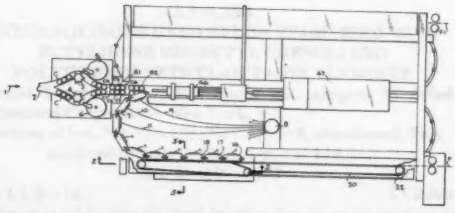
MECHANISM FOR LINING SHELLS

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 15, 1970, Ser. No. 72,263

Int. Cl. B29c *17/02*

U.S. Cl. 425—383 **7 Claims**



Mechanism and method for lining a series of pivotally interconnected shells each having bottom, side, and recessed end walls utilizes means for imparting movement to said shells along a predetermined path in end to end relation, means for moving a sheet of stretchable material alongside said series of shells in synchronism therewith, force applying means for urging said sheet of material into close frictional contact with the edges of the side walls of said shells, a pair of endless elements having their working reaches disposed alongside said shells and sheet and engagable with said sheet to urge portions thereof between the side walls of the shells into snug contact with the recessed ends of the shells, and vacuum means for drawing the sheet into flat face contacting relation with the bottom, sides and ends of the interior surfaces of said shells.

3,716,322

APPARATUS FOR FLATTENING AND TAKING AWAY BLOWN TUBING OF PLASTICS MATERIAL

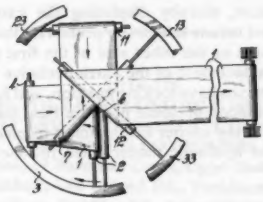
Friedrich Kratzert, Rosenheim-Schlossberg, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Sept. 22, 1970, Ser. No. 74,285

Claims priority, application Germany, Sept. 27, 1969, P 19 48 935.1

Int. Cl. B29c *17/00*

U.S. Cl. 425—392 **8 Claims**



The process serves to distribute any variations in thickness in the peripheral direction of the tubing, in conjunction with a process in which the tubing is blown and is either wound up or processed further in stationary devices. The plane in which the tubing is flattened is pivotally moved about the axis of the tubing reversingly in steps of at least approximately 360°. The flattened tubing is deflected about a deflecting member, which is reversingly moved in unison with the flattening plane and is laterally offset from the axis of rotation of the flattening plane and disposed in a plane that is at right angles to the flattening plane. The tubing is then moved about additional deflecting members, which are disposed in planes that are parallel to the plane which contains the first deflecting member and are also pivotally moved reversingly about the axis of rotation of the flattening plane. The angles through which the deflecting members are moved decrease as the distance from the flattening station increases. Successive deflecting members are alternatingly disclosed at least close to and more remote from the axis of rotation of the flattening plane. The tubing which has moved about the last deflecting member is moved in a constant direction in another plane, which is at right angles to the axis of rotation of the flattening plane.

3,716,323

INJECTION MOLDING MACHINE

Gunter Classen, Monchengladbach, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

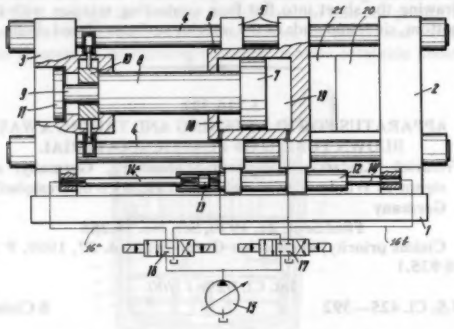
Filed Dec. 14, 1971, Ser. No. 207,922

Int. Cl. B28b *3/26*

U.S. Cl. 425—450 **2 Claims**

An injection molding machine having a stationary support one mold half, and a movable carrier for the other second half.

The movable carrier runs on rods and has a cylinder chamber with a first piston from which extends a piston rod; lock means may hold the rod in a particular position when retracting the lock, rod and piston can be displaced; a hydraulic motor including a cylinder attached to the carrier underneath thereof, has a stationary piston with two tubular piston rods, serving as conduits to and from the motor cylinder; first hydraulic control means provide for selectively pressurizing the motor cylinder to obtain relative displacement thereof by action on



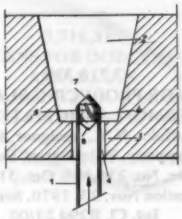
the second piston, thereby displacing the carrier. Second hydraulic control means selectively pressurize the chamber in the carrier on one or the other side of the first piston in the chamber for displacement of the carrier relative to the piston when the lock means have locking position, and for closing the chamber so that incompressible pressure fluid therein couples the first piston to the carrier for common displacement upon operation of the hydraulic motor when the lock means are retracted.

3,716,324

HIGH-INTENSITY BURNER FOR COMBUSTIBLE GAS

Marcel Maximilien Ponthoreau, and Claude Yves Marie Rozen, both of 16 Cognac, Charente, France, assignors to Martell & Co., Cognac (Charente), France

Filed Jan. 6, 1971, Ser. No. 104,417
Int. Cl. F23k 5/00
U.S. Cl. 431—185 6 Claims



A high intensity burner is provided in which the injector for the gas-air mixture extends into a combustion chamber through a hole in a wall of the chamber which provides an annular space between the injector and the wall so that a portion of the air required for combustion is introduced into the chamber through the space between the injector and the hole in the wall of the chamber. The device is especially useful for combustion chambers operated with fuel gases such as propane and butane.

CHEMICAL

ERRATUM
For Class 432—260 see:
Patent No. 3,716,223

3,716,325
DYEING COTTON OR REGENERATED CELLULOSE USING SULFUR DYES OXIDIZED WITH AQUEOUS SODIUM BROMITE SOLUTION

John Richard Aspland, Charlotte, N.C., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,593
Int. Cl. C09b *49/00;* **D06p** *1/30*
U.S. Cl. 8—37 **2 Claims**

Method for dyeing cotton or regenerated cellulose textile fibers with sulfur dyes, comprising the steps of applying at least one sulfur dye in reduced (leuco) form to said fibers and subsequently oxidizing said dye by contacting it with an oxidizing solution comprising water and sodium bromite and having pH 7–12.

3,716,326
PROCESS FOR PRINTING OF FABRICS CONSISTING OF SYNTHETIC FIBERS

Subodh Krishna Dutta; Krishnakant Girdharla Shah, and Jagdish Ishwarlal Setalvad, Ahmedabad, India, assignors to Ahmedabad Manufacturing & Calico Printing Co. Ltd., Ahmedabad, India

Filed March 4, 1970, Ser. No. 16,614
Int. Cl. D06p *3/54, 3/76*
U.S. Cl. 8—62 **4 Claims**

Process for the preparation of printed synthetic fabrics made of polyester and/or acrylic fibers which comprises firstly, in preparing the fabric from two groups of fibers, group (a) consisting of polyester and/or acrylic fibers and group (b) consisting of fibers which are soluble in mineral acids such as cotton and/or viscose and then printing the said fabric with such dyestuffs which are suitable only for synthetic fibers and finally removing by dissolving from the said printed fabric the bottom and/or viscose part, thereby obtaining printed fabric of polyester and/or acrylic fibers only.

3,716,327
POLYESTER FIBER DYED WITH MONOAZO COMPOUND CONTAINING AN ACYLAMIDOTETRAHYDROQUINOLINE GROUP

Max A. Weaver; James M. Straley, and Clarence A. Coates, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 812,411, April 1, 1969, Pat. No. 3,635,941. This application Sept. 23, 1971, Ser. No. 183,233
Int. Cl. D06p *1/18;* **C09d** *29/36*
U.S. Cl. 8—41 C **10 Claims**

A linear polyester textile fiber dyed with a water-insoluble azo compound having a 1-alkyl- or 1-cycloalkyl-7-acylamido-1,2,3,4-tetrahydroquinoline coupling component and certain substituted phenyl groups as the diazo component.

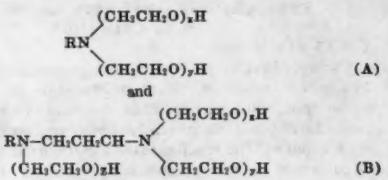
3,716,328
ANTHRAQUINONE DYED NYLON STABILIZED WITH BUTYLIDENE BIS (BUTYL CRESOL) AND POLYHYDROXYETHYL-OCTADECYLAMINES

Richard Eugene Mayer, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 774,175, Nov. 7, 1968, abandoned. This application Sept. 9, 1971, Ser. No. 179,222
Int. Cl. D06p *5/02*
U.S. Cl. 8—165 **2 Claims**

The rate of fading of dyed textiles due to ozone action is substantially reduced through the incorporation therein of:

a. a compound chosen from the class of amines with ethyleneoxy substituents having the structural formulas:



(A)

and

(B)

wherein R is an alkyl or aralkyl radical with four to 25 carbon atoms, and x, y and z are integers such that $x + y$ is equal to or less than 10 in A compounds and $x + y + z$ is equal to or less than 10 in B compounds; and

b. a phenolic compound chosen from the group consisting of 4,4′-butylidene bis(6-tert-butyl-m-cresol), p-nonylphenol, 1,3,5 trimethyl-2,4,6-tris (3,5 di-tert-butyl-4-hydroxy benzyl) benzene, and 6-tert-butyl-m-cresol.

3,716,329
DYEING POLYACRYLONITRILE WITH BASIC DYESTUFF AND ALKOXYMETHYL QUATERNARY AMMONIUM COMPOUNDS

John Komninos, 19 Barnfield Court, Upper Saddle River, N.J.; Peter Klemchuk, 148 Upland Rd., Yorktown Heights, N.Y., and George Ham, 284 Pine Rd., Briarcliff Manor, N.Y.

Continuation-in-part of Ser. No. 786,904, Dec. 26, 1968, abandoned. This application Nov. 27, 1970, Ser. No. 93,479
Int. Cl. D06p *5/04, 5/06*
U.S. Cl. 8—169 **12 Claims**

Fibrous material consisting at least predominantly of polyacrylonitrile is dyed in an aqueous dyebath containing a basic dyestuff and up to about 10 percent by weight of at least one alkoxymethyl quaternary ammonium compound as a decomposable retarder. An illustrative example of such a retarder is n-tetradecyloxymethyltributylammonium chloride.

3,716,330
DYEING SYNTHETICS USING ROLLER COATED MOLTEN DYE COMPOSITIONS

Kazuo Kitamura, Otokuni-gun, Kyoto-fu; Fumiki Takabayashi, and Fumio Shibata, both of Ibaraki-shi, Osaka-fu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 29, 1970, Ser. No. 76,599
Claims priority, application Japan, Sept. 29, 1969, 44/77577; Dec. 17, 1969, 44/101418; Dec. 22, 1969, 44/103137; April 24, 1970, 45/35158; April 21, 1970, 45/34098; April 22, 1970, 45/34546
Int. Cl. C09b *67/00;* **D06p** *5/04*
U.S. Cl. 8—169 **7 Claims**

A process for dyeing fabrics of synthetics fibers which comprised preparing a molten dye composition composed of dyestuff and organic matrix compound which is solid at normal temperature and has compatibility with the dyestuff in molten state, coating the molten composition onto the fabric under the condition not permitting the dyeing of the fabric, then heat-treating the coated fabric to induce the dyeing, and finally removing the remaining coating layer by washing.

3,716,331
PROCESS FOR PRODUCING CARBON FIBERS HAVING A HIGH YOUNG'S MODULUS OF ELASTICITY

Wesley A. Schalamon, Elyria, and Roger Bacon, Olmstead Falls, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 610,789, Jan. 23, 1967, abandoned. This application April 10, 1970, Ser. No. 28,167
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 7 Claims

Carbon fibers having a high Young's modulus are produced by a process which comprises longitudinally stressing partially carbonized cellulosic base fibers by means of an applied tensional force while concurrently subjecting them to a carbonizing treatment. The resultant stress carbonized fibers can then be subjected to a stress graphitizing treatment, if desired.

3,716,332
CARBONIZATION OF WOOL

Donald H. Leeds, Rolling Hills, Calif., assignor to Ducommun Incorporated

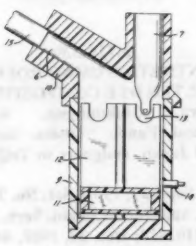
Filed July 27, 1970, Ser. No. 58,232
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 8 Claims

A fibrous carbon product is produced by subjecting a body of wool fibers in a furnace to a reduced pressure to remove essentially all of the oxygen from the furnace and thereafter heating said body of wool fibers at a reduced pressure in the absence of any appreciable oxygen to a temperature of at least about 800°F at which carbonization will occur. An inert gas such as nitrogen is preferably passed over the body during carbonization to remove reaction products.

3,716,333
PROCESS OF AND APPARATUS FOR THERMOMETRIC ANALYSIS

Gerd Peuschel, 3163 Sehnde, and Fritz Hagedorn, 3001 Bolzum ueber Han., both of Germany, assignors to Kali-Chemie A. G., Hannover, Germany

Filed Dec. 4, 1970, Ser. No. 95,153
Claims priority, application Germany, Dec. 9, 1969, P 19 61 633.2
Int. Cl. G01n *25/48*
U.S. Cl. 23—230 R 14 Claims

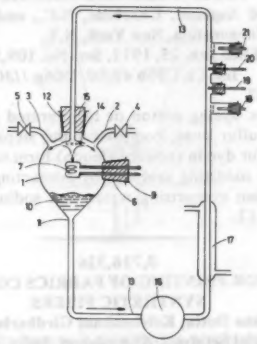


Process and apparatus for thermometric analysis in which a pump supplies a test solution containing a component, the concentration of which is to be determined, and a reagent solution, adapted to react with the component, to a reaction vessel containing a stirrer and a temperature sensor. The solutions are fed at controlled, constant rates to the reaction vessel through tubing immersed in a constant temperature bath, and the reaction vessel, consisting of a material having a relatively low thermal conductivity, is also immersed in the bath. The temperature in the reaction vessel on mixing the solutions is noted and compared with calibration data.

3,716,334
DETERMINATION OF ELEMENTS IN ORGANIC COMPOUNDS

Michel Pont, Saint-Fons, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Feb. 12, 1971, Ser. No. 114,767
Claims priority, application France, Feb. 16, 1970, 7005445; Jan. 4, 1971, 7100030
Int. Cl. G01n *27/26, 31/06, 31/12*
U.S. Cl. 23—230 PC 8 Claims



Apparatus for the rapid and automatic determination of elements such as halogen and sulphur in organic compounds comprises a closed vessel; means for introducing into said vessel and for supporting in said vessel a sample of said compound to be analyzed; means for filling said vessel with oxygen; means for causing combustion of said sample; means for causing circulation of an absorption liquid in a closed circuit including said vessel; means for determining and detecting said element to be analyzed in said absorption liquid; means for causing said absorption liquid to contact during the circulation thereof the inner surfaces of said vessel and said means for supporting said sample; and means for causing said circulation to cease when said determination is complete.

3,716,335
ASSAYING WITH CHANGE IN ELECTRON SPIN RESONANCE SPECTRUM BASED ON CHIRALITY

Edwin F. Ullman, Atherton, and Richard S. Schneider, Sunnyvale, both of Calif., assignors to Syva Corp., Palo Alto, Calif.

Filed May 3, 1971, Ser. No. 139,905
Int. Cl. G01n *27/78*
U.S. Cl. 23—230 R 15 Claims

A method and compounds are provided for determining amounts of energy or chemical reagents in a fluid medium by introducing into the medium a sensor which is a stable nitroxide radical functionality bonded through a methylene group to a central atom bonded to a plurality of functionalities, at least one of which participates in a chemical change, which results in a change of asymmetry about the carbon atom bonded to the methylene group.

3,716,336
METHOD FOR DETERMINING PROCAINAMIDE LEVELS IN BLOOD OR URINE

Chandra Kant Parekh, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

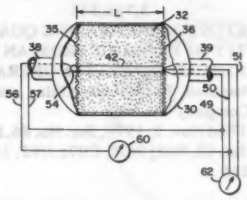
Filed June 28, 1971, Ser. No. 157,755
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B 6 Claims

A qualitative and quantitative determination of procainamide blood levels may be obtained by contacting a sample of urine or denatured blood with dimethylcinnamaldehyde in the presence of an acid and comparing the resulting characteristic color with a reference standard.

3,716,337
GAS MONITORING APPARATUS

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 6, 1970, Ser. No. 17,194
Int. Cl. G01n 25/48, 27/02, 31/06
U.S. Cl. 23—254 E 4 Claims

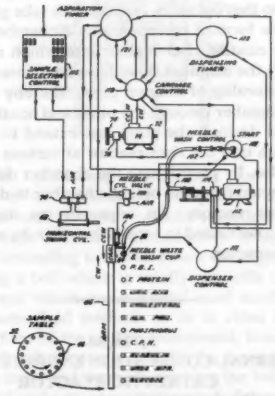


A gas containing carbon dioxide is passed over a bed of carbon dioxide absorbent which contains an elongated temperature sensor which measures the peak temperature along its length and provides a temperature signal. A second sensor which measures the temperature of the gas prior to its reaction with the absorbent provides a second temperature signal. The signals are combined to get a resultant which is indicative of the carbon dioxide present in the gas.

3,716,338
SAMPLE FLUID DISPENSING APPARATUS FOR CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Original application June 14, 1968, Ser. No. 737,065, now Patent No. 3,622,279. Divided and this application June 21, 1971, Ser. No. 155,154
Int. Cl. G01n 1/18, 33/16
U.S. Cl. 23—259 7 Claims

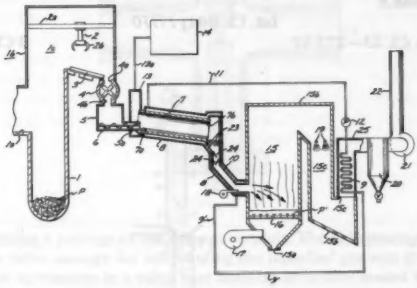


A sample pick up and dispensing apparatus for picking up samples to be tested from a sample container and discharging them into a plurality of testing containers. A water filled pick up and dispensing conduit actuated by a cylinder and piston assembly for providing accurate handling of the samples. An air interface piston and cylinder assembly connected to the conduit and cleaning means connected to the conduit for flushing water therethrough thereby preventing dilution of the sample and cross-contamination between different samples. Means for expelling a portion of the test sample back into the sample container prior to dispensing samples into the testing containers to insure constant delivery of the samples to the testing containers.

3,716,339
HYDROGEN CHLORIDE RECOVERY INCINERATOR FOR PLASTICS CONTAINING HYDROGEN AND CHLORINE

Masanobu Shigaki, Toyonaka-shi, Osaka; Shigehiro Kido, Itami-shi, and Yoshikazu Chiba, Yao-shi, Osaka, all of Japan, assignors to Takuma Kikan Mfg., Co., Osaka, Japan

Filed Dec. 14, 1970, Ser. No. 97,785
Int. Cl. F23g 7/00; C01b 7/08
U.S. Cl. 23—262 4 Claims



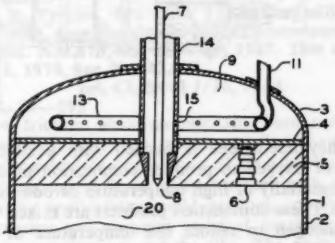
An apparatus for the disposal of scrap vinyl polymers containing chlorine and hydrogen. The apparatus includes a rotary kiln that is adapted to receive said scrap plastic and heat the same to a temperature at which the plastic partially decomposes, and the major portion of the chlorine escaping therefrom as hydrogen chloride gas, which gas together with any chlorine which results from the decomposition is recovered in a confined space for subsequent usage.

The partially decomposed scrap plastic is sequentially removed from the rotary kiln in a dried state and crushed. The crushed plastic is discharged by a blower onto a grate in a furnace where the scrap plastic is burned. The hot gases of combustion from the burning together with fines and dust arising from the burning operation are conducted through a passage to heat air that is subsequently used in the heating of the rotary kiln. The hot gases of combustion, together with entrained solid materials, are discharged into a dust collector to remove the fines and dust therefrom. The gases after being freed of solid materials are subsequently discharged through a chimney to the ambient atmosphere. The gases discharged to the ambient atmosphere are substantially free of chlorine and hydrogen chloride gases.

3,716,340
CARBON BLACK REACTOR

Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 16, 1970, Ser. No. 72,637
Int. Cl. C09c 1/48
U.S. Cl. 23—259.5 3 Claims



A carbon black reactor employing a support for a suspended arch, the support forming a section between itself

and the head of the reactor into which the oxidizing gas is introduced to cool the support.

3,716,341

CRUCIBLE-FREE ZONE MELTING DEVICE HAVING AN ANGLED HEATING COIL

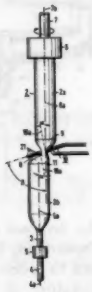
Otto Schmidt, Erlangen, Germany, and Siemens Aktiengesellschaft, 03, Berlin and Munich, Germany

Filed Nov. 30, 1970, Ser. No. 93,650

Claims priority, application Germany, Nov. 29, 1969, P 19 60 088.5

Int. Cl. B01j *17/10*

U.S. Cl. 23—273 SP **3 Claims**



Device for crucible-free zone melting a crystalline rod end-supported by holders of which one holder is rotatable about the longitudinal axis thereof includes a flat induction heating coil surrounding the longitudinal axis of the other holder for heating a molten zone formed in the crystalline rod, the induction heating coil having a plurality of windings disposed in a single plane, the plane extending at an acute angle defined by a normal to said plane of said windings and the longitudinal axes of both rod holders having a valve within the range of 0.5° to 3°.

3,716,342

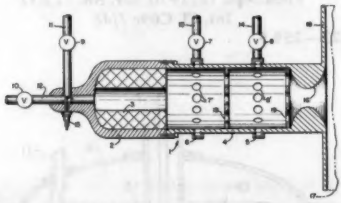
GENERATION OF CARBON DIOXIDE HAVING A POPULATION INVERSION

Donald R. Matthews, San Jose, and Allen L. Holzman, Palo Alto, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 25, 1969, Ser. No. 802,013

Int. Cl. B01j *7/00*

U.S. Cl. 23—281 **5 Claims**



Tetrahcyanoethylene is burned with a stoichiometric amount of oxygen to produce combustion products consisting essentially of high temperature carbon dioxide and nitrogen. These combustion products are mixed with additional nitrogen to reduce the temperature of the combustion products and to take advantage of the efficient energy transfer between excited nitrogen and carbon dioxide.

In addition, small amounts of hydrogen may also be burned to produce water which increases the rate of de-excitation of the lower vibrational levels of carbon dioxide molecules and thereby increase the efficiency of a lasing process. The hot gases so produced may then be expanded into and caused to flow continuously through a laser tube, whereby a continuous wave laser may be operated.

3,716,343

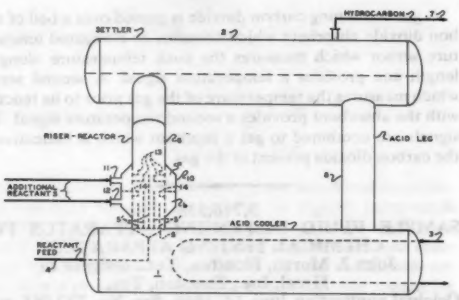
APPARATUS FOR INCREASING QUALITY AND QUANTITY OF PRODUCT FROM AN EXISTING CHEMICAL APPARATUS OPERATION

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 2, 1970, Ser. No. 86,156

Int. Cl. B01j *9/08*; C07c *3/12, 3/54*

U.S. Cl. 23—285 **4 Claims**



An existing riser-reactor into which reactants are injected for reaction therein through a plurality of nozzles is modified to provide the same with additional nozzles and as desired the nozzles are arranged to inject the same or different reactants to portions of the riser-reactor which are separated each from the other so that optimum reaction can take place in each portion. In one form of the apparatus a chamber is constructed around an existing riser-reactor into which at the place surrounded by the chamber there have been inserted and fixed to its wall a plurality of nozzled pipes whereby to feed reactant from the chamber through the pipes and nozzles into the riser-reactor. As desired, the pipes can extend to provide nozzles for injection into the riser-reactor at various depths or levels therein. Also, by partitioning the chamber different reactants can be injected from the overall chamber to different portions of the riser-reactors. An apparatus as described can be originally constructed in toto rather than by modifying an existing riser-reactor.

3,716,344

INTERNAL COMBUSTION ENGINE EXHAUST CATALYTIC REACTOR

Dillion P. Ashburn, Ogden, Utah, assignor to New Products Corporation, Ogden, Utah

Filed Feb. 10, 1971, Ser. No. 114,175

Int. Cl. F01n *3/14*; B01j *9/04*

U.S. Cl. 23—288 F **11 Claims**

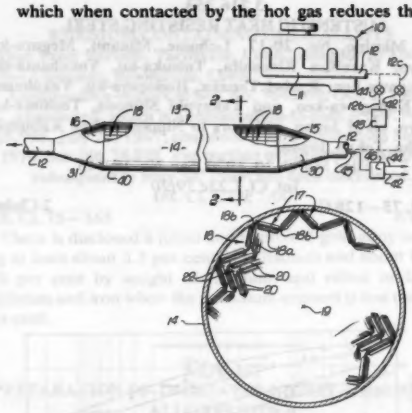
A catalytic reactor to be connected in series with ducting for hot gases containing CO_2 comprises:

a. a longitudinally elongated generally tubular case having lengthwise spaced entrance and exit ports, the entrance port to receive said gas at elevated temperature, and

b. multiple metallic fins extending generally longitudinally in the case and in closely packed relation to form multiple flow passages for said gas, the passages being spaced apart transversely of the case,

c. and the fin surface metal consisting of a copper catalyst

which when contacted by the hot gas reduces the CO_2



content thereby to increase the oxygen content in the gas discharge from said exit port.

3,716,345

CZOCHRALSKI CRYSTALLIZATION OF GALLIUM ARSENIDE USING A BORON OXIDE SEALED DEVICE

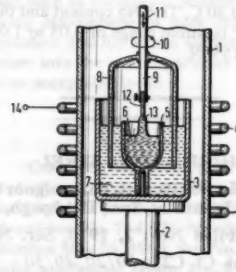
Josef Grabmaier, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 13, 1970, Ser. No. 19,289

Claims priority, application Germany, March 18, 1969, P 19 13 682.4

Int. Cl. B01j *17/18*; C01g *15/00*

U.S. Cl. 23—301 SP **2 Claims**



Method of producing according to Czochralski, monocrystals of semiconductive compounds easily decomposable at their melting point includes surrounding a crucible containing a melt of such semiconductive compound with a fluid medium extending to a level below the edge of the crucible, immersing a bell which is axially rotatable and vertically displaceable and which has a crystal seed axially suspended therewithin, into fluid medium so as to close off a volume above the surface of the molten compound, lowering the bell further into the fluid medium until the crystal seed is immersed in the melt, and thereafter raising the bell so as to pull the seed crystal and a monocrystalline rod of the semi-conductive compound out of the melt; and device for carrying out the method.

3,716,346

METHOD OF DISSOLVING LIQUEFIED CHLORINE IN AN AQUEOUS SOLVENT

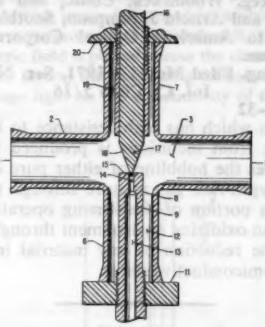
Udell T. Greene, Florham Park, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 832,747, June 12, 1969. This application Sept. 21, 1970, Ser. No. 74,134

Int. Cl. B01d *11/00*; B01f *3/08*; C01b *7/02*

U.S. Cl. 23—312 R **1 Claim**

A single-seated valve assembly for introducing a controlled, non-surging flow of soluble liquefied gas directly into a stream of liquid solvent flowing through a conduit permits essentially full pressure on the liquefied gas to the region of incipient solution while suppressing vaporization of the gas. The valve body can be essentially cross-shaped with the valve passage



forming a passage of the solvent conduit. The side passage into the valve passage for introducing the liquefied gas into the solvent terminates in a valve seat housing an orifice sealed by the end of a valve stem depending from across the valve passage.

3,716,347

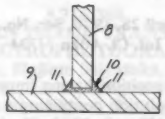
METAL PARTS JOINED WITH SINTERED POWDERED METAL

Theodore R. Bergstrom, Little Canada, and Philip D. Takkunen, Woodbury Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 21, 1970, Ser. No. 73,891

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.2 **17 Claims**



Metal parts are joined together with sintered powdered metal by applying a mixture of powdered metal and an organic heat-fugitive binder to the parts at the locus of the joint of to be formed therebetween, assembling the parts in their desired joined configuration, and heating the assembly to volatilize or burn-off the binder and sinter the powdered metal.

3,716,348

METHOD OF FORMING ABRASION-RESISTANT SELF-LUBRICATING COATING ON FERROUS METALS AND ALUMINUM AND RESULTING ARTICLES

Garry R. Perkins, 106 Lake Lane, Cary, Ill. 60013

No Drawing. Continuation-in-part of abandoned application Ser. No. 670,439, Sept. 25, 1967. This application June 1, 1970, Ser. No. 42,576

Int. Cl. B44d *1/16, 1/44*

U.S. Cl. 29—195 **8 Claims**

A low friction, abrasion resistant, hard surface, non-stick coating comprising nickel and fluorocarbon material, and method of application of such coating, furnishing coatings useful for friction surfaces such as cylinder and bearing applications, mold coatings, cooking utensils, and corrosion and abrasion resistant coatings for chemical process equipment and the like. The process may be carried out without pressurized, laminating, or other specialized apparatus.

3,716,349

METHOD FOR PRODUCING LASER GLASSES HAVING HIGH RESISTANCE TO INTERNAL DAMAGE AND THE PRODUCT PRODUCED THEREBY

Emil W. Deeg, Woodstock, Conn., and Elias Snitzer, Wellesley, and Arnold J. Simpson, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

No Drawing. Filed May 17, 1971, Ser. No. 144,238
Int. Cl. C03b 5/16
U.S. Cl. 65—32 7 Claims

Laser glass which has high resistance to internal damage resulting from inclusions is produced by a method which includes the bubbling of either pure oxygen or an oxidizing oxygen-rich gas mixture through the melt during at least a portion of the stirring operations in order to maintain an oxidizing environment throughout the melt to prevent the reduction of any material in the melt to metallic or semiconductive states.

3,716,350

APPLYING UREA IN THE MOLTEN STATE TO CROPS

Saburo Hashimoto, Yorba Linda, Calif., assignor to Union Oil Company, Los Angeles, Calif.

Filed March 3, 1969, Ser. No. 803,980
Int. Cl. C05c 9/00; C07c 127/00
U.S. Cl. 71—28 7 Claims

Urea is distributed onto the area to be fertilized by dropping particles of molten urea into the atmosphere 20-500 feet over the area such that the molten urea solidifies into small prills before contacting the area to be fertilized.

3,716,351

ALGAECIDE COMPOSITION HAVING IMPROVED STABILITY

Donald H. Kunkel, Route No. 2 Box 9, Eagle, and Donald E. Seymour, 2608 East Newton Avenue, Milwaukee, both of Wis.

Filed April 28, 1970, Ser. No. 32,780
Int. Cl. A01n 11/04
U.S. Cl. 71—67 8 Claims

An algaecide composition having improved stability comprising an aqueous solution containing a complex which is a reaction product of either a copper salt or a cobalt salt with an alkanolamine. The solution also contains an effective amount of an acetylenic diol and an alkali metal halogenate, such as sodium chlorate, which aid in preventing the complex from decomposing during extended periods of storage.

3,716,352

SINTERED DESULFURIZER FOR OFF-FURNACE USE

Hiroshi Ooi, and Hakaru Nakato, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Fukigi-ku, Kobe City, Japan

Filed Oct. 21, 1970, Ser. No. 82,717
Claims priority, application Japan, Oct. 24, 1969, 44/84663; Sept. 24, 1970, 44/83224; Sept. 24, 1970, 45/83223
Int. Cl. C21b 1/10, 3/02
U.S. Cl. 75—58 6 Claims

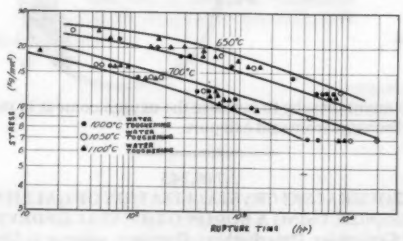
A desulfurization composition for off-furnace use consisting of crushed particles of sintered material comprising 100 parts by weight of calcium oxide and 3 to 50 parts by weight, in total, of at least one compound selected from the group consisting of up to 30 parts by weight of calcium fluoride, sodium fluoride, magnesium fluoride, barium fluoride, and sodium silicofluoride, and up to 40 parts by weight, in terms of sodium carbonate, of sodium carbonate, sodium hydroxide, and sodium oxide.

3,716,353

AUSTENITIC HEAT RESISTING STEEL

Tohru Mimino, No. 20-17, 1-chome, Minami, Meguro-ku, Tokyo; Kazuhisa Kinoshita, Totsuka-ku, Yokohama-shi, Kanagawa-ken; Ryohei Tanaka, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, and Takayuki Shinoda, Toshima-ku, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed March 10, 1970, Ser. No. 18,245
Int. Cl. C22c 39/20
U.S. Cl. 75—128 G 2 Claims



Cr–Ni system austenitic heat resisting steel having higher heat resistibility at elevated temperatures and for a longer time than common austenitic stainless steel by the multiplied effects of 0.03 to 0.30 C, Ti + Nb content and that the atomic ratio of Ti + Nb/C is within range of 0.05 to 1.0, 0.2 to 4.0% Mo and 0.04 to 0.15% N.

3,716,354

HIGH ALLOY STEEL

Orville W. Reen, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,358
Int. Cl. C22c 39/20, 39/50
U.S. Cl. 75—128 W 5 Claims

Described herein is a composition consisting essentially of, in weight percent, 16–25% chromium, 10–22% nickel, 4–10% molybdenum, up to 0.08% carbon, up to 2.0% manganese, up to 1.5% silicon and the balance essentially iron and steel making residuals.

3,716,355

ALUMINUM BASE ALLOY

Keith Gordon Wikle, Oak Harbor, Ohio, and Richard George O'Rourke, Fremont, both of Ohio, assignors to The Brush Beryllium Company, Cleveland, Ohio

Filed Sept. 30, 1971, Ser. No. 185,440
Int. Cl. C22c 21/02
U.S. Cl. 75—142 8 Claims

There is provided an aluminum base alloy characterized by a substantial amount of silicon and nickel together with smaller amounts of copper and magnesium, and further characterized by the presence therein of beryllium and titanium, said alloy being useful in making molds where hardness and replication of fine detail is required. Latent within the as-cast alloy is developable hardness, fine grain structure, and freedom from microporosity obtained by submitting the alloy cast at from 1,000° to 1,100° F. to a further thermal history.

3,716,356

RHENIUM CONTAINING GOLD ALLOYS

Arthur Peter Burnett, Tariffville, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 764,589, Oct. 2, 1968, abandoned, which is a continuation-in-part of Ser. No. 665,995, July 26, 1967, abandoned. This application Sept. 23, 1970, Ser. No. 74,825. The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl. C22c *5/00*

U.S. Cl. 75—165 8 Claims

There is disclosed a novel and improved gold alloy containing at least about 5.5 per cent of palladium and about 0.03 to 1.0 per cent by weight of rhenium, and either or both of platinum and iron when the palladium content is less than 25.0 per cent.

3,716,357

PREPARATION OF THORIATED NICKEL-CHROMIUM ALLOY POWDER

David John Ivor Evans, North Edmonton, Alberta; David Alan Wayne Fustakian, Edmonton, Alberta; Leon Fredrick Norris, and Robert William Fraser, both of Fort Saskatchewan, Alberta, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed April 3, 1969, Ser. No. 813,214

Int. Cl. C22c *1/10*

U.S. Cl. 75—0.5 BC 8 Claims

Nickel-chromium alloy powder containing dispersed refractory oxide particles is produced by heating nickel powder particles containing physically inseparable sub-micron refractory oxide particles, a major portion of which are fixed in the surfaces of the nickel particles, in contact with a chromium source material, such as chromium powder or chromium oxide, in a flowing atmosphere of pure dry hydrogen at an elevated temperature and for a time sufficient to effect diffusion of chromium into the nickel particles and to reduce excess oxygen to an acceptable level.

3,716,358

COLLOID METALLURGY

Akira Oka, 71, 1-chome, Sugamo, Toshimu-ku, Tokyo, Japan

Continuation-in-part of Ser. Nos. 611,253, Jan. 24, 1967, abandoned, and Ser. No. 714,076, March 18, 1968. This application May 26, 1969, Ser. No. 827,997

Claims priority, application Japan, Jan. 25, 1966, 41/3885

Int. Cl. B22f *1/00*

U.S. Cl. 75—225 14 Claims

A process for producing non-porous full-density metal articles comprising forming a porous compact colloidal substantially pure metal particles having a maximum mean particle size of 0.2 micron, said metal being at least one metal selected from silver and the metals of groups IIIb, IVb, Vb, and VIII of the Periodic Table of the Elements, and then sintering said porous compact at a temperature substantially below the melting point of said metal and thereby forming a non-porous fully dense metal article within 10 minutes of initiation sintering, and maintaining said porous metal compact in a vacum or an inert atmosphere until said full-density metal article is formed.

3,716,359

CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD

Nicholas K. Sheridon, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 23,649, March 30, 1970, abandoned. This application Dec. 28, 1970, Ser. No. 101,729

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.1 102 Claims

The applications of elastomers to various imaging techniques are described which may be used for the cyclic recording, storage and subsequent erasure of optical information. Several embodiments of the invention are described, all of which form images by the elastic deformation of a thin elastomer layer. The pattern of the surface deformation, in general, follows the light distribution of the optical image being recorded. This image is formed on a photoconductive layer which is adjacent to, or integral with, the elastomer layer. An electric field is placed across the elastomer and the photoconductor layers, the field being modulated by the action of the image light on the conductivity of the photoconductor and provides the mechanical force necessary to deform the elastomer. Once the elastomer surface has deformed, it will in general remain deformed as long as the field across it is maintained; the image recorded, accordingly, being stored. Removing the electric field allows the elastomer to relax and the image is consequently erased. Reversing the field increases the rate at which the image is erased. A new image may now be formed, and the cycle started over again. Such an elastomer material is capable of a great many recording/storage/erasure cycles.

3,716,360

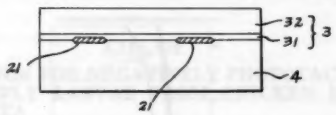
MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY

Osamu Fukushima, Hajime Miyatuka, and Satoru Honjo, Asaki-shi, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Kanagawa, Japan

Filed Feb. 19, 1971, Ser. No. 116,964

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.4 7 Claims



A process of transferring a toner image obtained by electrophoretic development comprising employing a liquid developer containing a thermoplastic resinous material which is included in the developed image, forming an image on an electrophotographic recording layer, bringing a heat-sensitive adhesive tape into an intimate contact with said image, heating the assembly so as to soften the resinous material included in the developed image but not to soften the heat-sensitive adhesive layer whereby the image is perfectly transferred to the adhesive tape, separating the tape from the recording layer and finally laminating the image-bearing tape onto a suitable support by softening the adhesive layer.

It should be noted that the recording layer does not melt nor soften at the temperature at which the developed image is softened and transferred.

3,716,361

PROCESS OF FORMING SILVER TRANSFER IMAGES

Robrecht Julius Thiers, Brasschaat; Josef Frans Willems, Wibijk, and Roger Alois Spriet, Edegem, all of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Germany

Filed Oct. 12, 1970, Ser. No. 80,151

Claims priority, application Great Britain, Oct. 27, 1969, 52,571/69

Int. Cl. G03c 5/54

U.S. Cl. 96—29 R 12 Claims

A process for the production of silver images according to the silver complex diffusion transfer process carried out in the presence of a hydroxylamine derivative developing agent and a (poly)amino(poly)carboxylic acid sequestering agent in acid form or in the form of a water-soluble salt is described. Better quality transfer images at substantially lower illumination levels are realized.

3,716,362

PROCESS FOR THE REMOVAL OF METALLIC SILVER FROM PHOTOGRAPHIC MATERIAL

Max Meier, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basle, Switzerland

Filed July 21, 1970, Ser. No. 56,945

Claims priority, application Switzerland, July 30, 1969, 11605/69

Int. Cl. G03c 7/00, 5/50, 5/32

U.S. Cl. 96—60 R 49 Claims

A process for removing metallic silver from photographic materials is provided, wherein any sparingly soluble silver salts present are not attacked. This process comprises treating the photographic material with an acid bath free from anions that form sparingly soluble silver salts and which bath contains an oxidant and a complexing agent. The oxidant has a standard redox potential of at most +0.8 Volts and the complexing agent has a silver complex stability constant of at most 10^9 $(liter/mole)^2$. This process is of special importance in carrying out the silver dye bleach negative-positive process. The main advantage of the process is the fact that it uses only a small number of bathes and no strong oxidants.

3,716,363

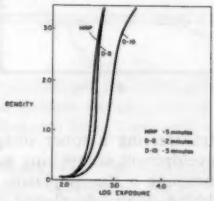
METHOD OF MAKING PHOTOMASKS OF THE TYPE USED IN THE FABRICATION OF MICRO-ELECTRONIC CIRCUITS

Paul A. Ruggerio, Auburn, Mass., assignor to GTE Laboratories Incorporated, Bayside, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,940

Int. Cl. G03c 5/24, 5/26, 5/30

U.S. Cl. 96—66 R 13 Claims



A method of making photomasks containing lines of various widths for use in the fabrication of microelectronic circuits. The method utilizes a two-step development process to essentially eliminate the effects of optical diffraction and provide both thick and thin lines having a high degree of acutance, density and dimension control. The first development step utilizes a low-contrast developer to produce a nearly constant-density image over a wide exposure latitude. The second step employs a high-contrast developer which enhances the density in areas developed by the first step.

3,716,364

DIAZOTYPE MATERIALS

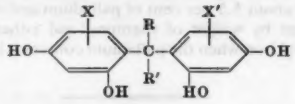
Joseph K. Gogola, Rolling Meadows, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Sept. 2, 1970, Ser. No. 69,167

Int. Cl. G03c 1/58

U.S. Cl. 96—75 5 Claims

Two-component diazotype sheet materials are described which form dense azo dye images and produce only slight bleeding and background coloration. The sheet material is coated with a conventional light-sensitive diazo compound and a coupling component of the formula



wherein R is lower alkyl or lower hydroxyalkyl, R′ is hydrogen or lower alkyl, and X and X′ are hydrogen, halogen, lower alkyl, lower alkoxyl, sulfo or nitro.

3,716,365

PROCESS FOR MAKING BREWERS' WORT

Martin F. Walmsley and John V. Cross, London, Ontario, Canada, assignors to John Labatt Limited, London, Ontario, Canada

Continuation-in-part of application Ser. No. 841,830, July 15, 1969. This application July 7, 1970, Ser. No. 52,999

Claims priority, application Great Britain, July 8, 1969, 34,409/69; July 21, 1969, 36,473/69, 36,474/69; July 23, 1969, 36,964/69

Int. Cl. C12c 7/00

U.S. Cl. 99—51 16 Claims

This invention provides a process for manufacturing a brewers' wort in which an aqueous slurry of a raw starch-containing material is treated under defined temperature and time conditions with discrete amylase and protease enzymes employed at defined activity levels and amylase: protease ratios with respect to the starch-containing material. In this process, the mash bill contains no more than about 30% by weight malt, advantageously no more than about 20% by weight, so that the traditional reliance upon malt (a relatively expensive and complex material) is greatly lessened. Preferably, the mash bill includes up to about 60% by weight of a cereal adjunct, say liquefied corn grits. Preferred embodiments of this process are based on a mashing cycle with a proteolytic reaction at 40° to 55° C. for 30 to 120 minutes followed by a stepwise solubilisation and saccharification procedure involving heating at 64° C. to 68° C. for 35 to 60 minutes at 70° to 80° C.

The invention also includes an enzyme system of defined and standardized activity for use in the conversion of the starch-containing material, and a process for the manufacture of beer or like non-distilled alcoholic beverage.

3,716,366

BIS-PYRIDINIUM SALT AND A PHENYL BORANATE AS PHOTOSENSITIVE COMBINATION

Oskar Riester, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 1, 1971, Ser. No. 111,764

Claims priority, application Germany, Feb. 19, 1970, P 20 07 524.5

Int. Cl. G03c 1/00, 1/52

U.S. Cl. 96—88 4 Claims

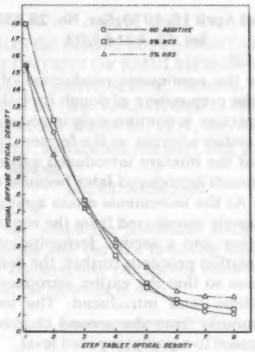
Dark colored images are obtained by imagewise exposure of light-sensitive layers containing bis-pyridinium compounds and organic boran compounds as explained below.

3,716,367

N-SUCCINIMIDE ADDITIVES FOR AZIDE IMAGING SYSTEMS

Hiei Ando, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 26, 1971, Ser. No. 147,111
Int. Cl. G03c 1/52, 1/72
U.S. Cl. 96—91 N 6 Claims



Dry photoimaging processes and compositions employing 1,8-diazidonaphthalene and certain N-substituted succinimide additives in a permeable film-forming plastic are disclosed.

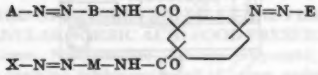
3,716,368

PHOTOGRAPHIC, LIGHT-SENSITIVE MATERIAL CONTAINING A TRISAZO DYESTUFF

Alfred Froehlich, Marly-le-Grand; Bernhard Piller, Marly-le-Petit, and Hansrolf Loeffel, Berne, all of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Continuation-in-part of Ser. No. 753,899, Aug. 20, 1968. This application Sept. 23, 1970, Ser. No. 74,860
Int. Cl. G03c 1/10
U.S. Cl. 96—99 17 Claims

Photographic light-sensitive material, especially for the silver dyestuff bleaching process is provided. This material is characterized in that it contains on a support in at least one layer a trisazo dyestuff of the formula



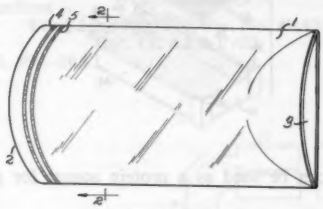
wherein A, K, B and M each represents an aromatic or heterocyclic radical and E represents a radical derived from a coupling component. The dyestuff molecule moreover contains one or more groups conferring solubility in water and also may be present in the form of its metal complex compound. These trisazo dyestuffs absorb in the most diverse wave-length ranges. The trisazo dyestuffs are very fast to diffusion, have high color strength, are readily soluble and compatible with cations.

3,716,369

PROCESS FOR COOKING FOODS IN POLYALKYLENE TERAPHALATE FILM BAG

Sol J. Periman, 150 West Ostend St., Baltimore, Md.

Continuation-in-part for Ser. No. 842,570, July 17, 1969, Pat. No. 3,578,239, which is a continuation-in-part of Ser. No. 630,961, April 14, 1967, Pat. No. 3,478,952. This application Aug. 5, 1970, Ser. No. 61,049
Int. Cl. B65b 25/22
U.S. Cl. 99—1 9 Claims



A process for cooking foods in polyalkylene terephthalate film bags is disclosed, wherein at least one side or bottom of such bags is formed by two distinct adhesive bands. The inner band is a thermoplastic adhesive which allows a measure of "peelability" and "shock absorbability," whereas the outer adhesive band is a high strength thermosetting adhesive. During the cooking process the side of the bag having the adhesive bands will open to the atmosphere.

3,716,370

A METHOD OF HEATING A PACKAGE OF FOOD

Robert P. Bemiss, Hillsborough, Calif., assignor to Robolex, Inc.

Division of Ser. No. 844,494, July 24, 1969, Pat. No. 3,580,478. This application Feb. 24, 1971, Ser. No. 118,429
Int. Cl. B65b 29/08
U.S. Cl. 99—1 1 Claim

The method provides for heating a food package by boiling wherein between the lid and the tray a liquid-tight mechanical connection is provided, plus a gas-tight meltable seal. In heating under water the seal melts and allows the escape of steam from the interior while the mechanical connection maintains the interior free of indrawn water.

3,716,371

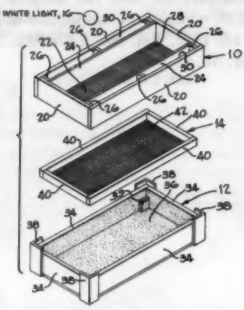
SEPARATOR FOR NEGATIVELY PHOTOTACTIC HOUSEFLY LARVAE FROM CHICKEN HEN EXCRETA

Corlette C. Calvert, Laurel, and Neal O. Morgan, Silver Spring, Md., and Richard D. Martin, Tucson, Ariz., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Feb. 8, 1971, Ser. No. 113,470
Int. Cl. A23k 1/00
U.S. Cl. 99—4 3 Claims

An apparatus for separating negatively phototactic housefly larvae from chicken hen excreta and collecting the larvae to allow them to pupate comprised of two compartments, an upper one having a screened floor and a lower one having a solid floor, a screened tray fitted into the lower compartment and a source of white light. Chicken hen excreta in the upper compartment is seeded with housefly eggs, the eggs are allowed to hatch and the larvae to tunnel and aerate the manure, thus deodorizing and reducing the moisture content of the manure by

more than 50%. The larvae migrate out of the manure and pupate in the lower compartment. When dried and ground



the pupae can be used as a protein source for growing chicks.

3,716,372

PROCESS FOR MANUFACTURE OF SOY CONCENTRATES, SOY ISOLATES AND RELATED PRODUCTS

Potito U. de Paolis, 144-D Camden Drive, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 848,516, Aug. 8, 1969, abandoned. This application Nov. 16, 1970, Ser. No. 89,829

Int. Cl. A23j *1/14*; A23l *1/20*

U.S. Cl. 99—17 **10 Claims**

After destruction of the trypsin inhibitors in dehulled soy bean material (such as meal or flakes) as by boiling or near-boiling, in water, for a short period of time, the resulting solids are rendered almost 100 percent soluble or dispersible in water by introducing from about 0.1 ml. to about 2 ml. of a solution containing the enzyme catalase by weight, each ml. of solution containing 1000 Baker units of the enzyme catalase, to each 100 grams of starting soy bean material and not allowing any hydrogen peroxide to be introduced. The introduction of catalase into the soy bean material is found to produce a soy concentrate and soy isolate having almost 100 percent dispersibility and increased NSI solubility while having greatly improved flavor characteristics.

3,716,373

PROCESS FOR AGGLOMERATING INSTANT COFFEE

David Rhodes, 1 Heron Way, Broughton Park, and Derek Watridge, 22 Deep Dene Avenue, Dorking, both of England

Filed Nov. 20, 1970, Ser. No. 91,597

Int. Cl. A23f *1/08*

U.S. Cl. 99—71 **4 Claims**

An improved process for agglomerating soluble coffee powder has been discovered which produces agglomerates having a pleasing light color, good mechanical strength and a granular appearance. The coffee particles are compacted and form desired clusters on release from a feed box to the steam jets.

3,716,374

METHOD OF INCREASING SOLUBILITY OF FOOD ACIDULENTS

Esra Pitchon, Flushing, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 764,633, Oct. 2, 1968. This application July 12, 1971, Ser. No. 161,966

Int. Cl. A23l *1/00*

U.S. Cl. 99—78 **9 Claims**

Fumaric or adipic acid is partially coated with an aqueous mixture of larch gum and either propylene glycol or glycerol. The coated acid is impact milled to a particle size less than 25 microns and mixed with a hydroxycarboxylic acid such as citric acid. The mixture which can include granular sucrose is impact milled to form aggregates each having a particle size less than 25 microns and a moisture content of from about 1% to about 5%.

3,716,375

CONTINUOUS BREW FERMENTATION

Melburn B. Hancock, Richmond, Va., assignor to AMF Incorporated

Filed April 15, 1970, Ser. No. 28,582

Int. Cl. A21d *8/02*

U.S. Cl. 99—90 CB **18 Claims**

A method for the continuous production of a fermented brew for use in the preparation of dough for bakery products. A fermentable mixture is continuously introduced into a first fermentation chamber wherein, as the fermentation proceeds, the increments of the mixture introduced earlier will remain above the increments introduced later because of their lower relative density. As the increments attain a minimum density they are continuously transferred from the top of the first fermentation chamber into a second fermentation chamber in which, as fermentation proceeds further, the density of the increments increases so that the earlier introduced increments remain below those later introduced. The increments are removed continuously from the second chamber after their density has increased to a predetermined level.

3,716,376

METHOD AND APPARATUS FOR MAKING CHEESE

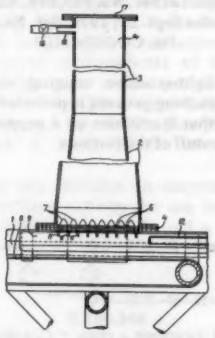
Reginald Thomas Clark, Staines, England, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Nov. 12, 1969, Ser. No. 875,959

Claims priority, application Great Britain, Nov. 13, 1968, 53,924/68

Int. Cl. A23c *19/00*; A01j *25/12*

U.S. Cl. 99—115 **4 Claims**



Curds substantially freed from whey are fed into a vertical tower and extruded under pressure through a plurality of apertures in the base of the tower, and the curds are subjected to a lateral spreading action and to a lateral compressive action as they travel downwardly through the tower toward the extrusion apertures. The extruding pressure may be provided by applying pneumatic pressure to a head space in the tower, and the extruded curd may be cut into separate lengths by cutting means located below the tower base.

3,716,377
PREPARATION OF CHEESE
Arthur Bratland, Maudsvei 9, Heie, Notteroy, Norway
Filed Aug. 28, 1969, Ser. No. 853,940
Claims priority, application Norway, Sept. 3, 1968, 3410/68
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 5 Claims

Cheese is made from an emulsion which contains a fat fraction including at least 25 percent non-milk fat, fat-free milk solids, butter serum and buttermilk.

3,716,378
PREPARATION OF FOODSTUFFS CONTAINING A HIGH CONTENT OF EMULSIFIED FAT
Arthur Bratland, Maudsvei 9, Heie, Notteroy, Norway
Continuation of Ser. No. 764,343, Oct. 1, 1968, abandoned. This application March 24, 1971, Ser. No. 127,787
Claims priority, application Norway, Oct. 2, 1967, 169,934; Sept. 6, 1968, 3464/68
Int. Cl. A23d *3/02*
U.S. Cl. 99—122 R 9 Claims

A process for preparing foodstuffs such as cream substitutes, margarine and the like involving emulsifying fat and fat-poor milk constituents containing membrane substances that enclose the fat globules in milk.

3,716,379
PREPARATION OF BEEF AND CHICKEN FLAVORING AGENTS
Pierre Joseph van Pottelsberghe de la Potterie, Columbus, Ohio, assignor to Societe D'Assistance Technique pour Produits Nestle SA, Lausanne, Switzerland
Filed Oct. 6, 1970, Ser. No. 78,590
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N 12 Claims

Meat flavoring agents are obtained by reacting a plant protein hydrolysate with thiamine and a mono or polysaccharide, the hydrolysate containing no cystine or cysteine.

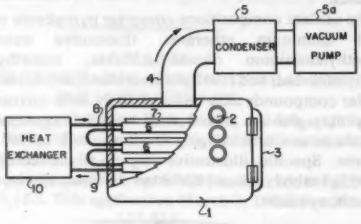
3,716,380
BEEF FLAVOR
Pierre Joseph van Pottelsberghe de la Potterie, Columbus, Ohio, assignor to Societe D'Assistance Technique pour Produits Nestle SA, Lausanne, Switzerland
Filed Oct. 6, 1970, Ser. No. 78,591
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 N 14 Claims

A beef flavoring agent is obtained by reacting a protein hydrolysate, methionine and a saccharide, optionally in the presence of a carboxylic acid.

3,716,381
METHOD OF PRESERVING MEAT AND FISH WITH A GRANULAR SORBIC ACID FOOD PRESERVATIVE
Ryuzo Ueno, Nishinomiya; Tetsuya Miyazaki, Itami, and Shigeo Inamine, Nishinomiya, all of Japan, assignors to Ueno Pharmaceutical Co., Ltd., Higashi-ku, Osaka, Japan
Continuation-in-part of Ser. No. 714,454, March 20, 1968, abandoned. This application Aug. 14, 1970, Ser. No. 63,913
Claims priority, application Japan, March 27, 1967, 42/18677
Int. Cl. A23b *1/00, 3/00*
U.S. Cl. 99—157 12 Claims

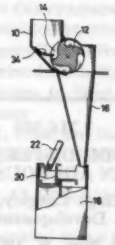
A method of preserving meat and fish products subjected to heat treatment in a final finishing which comprises adding to the raw meat or fish a granular preservative comprising sorbic acid powder particles whose surface has been coated with a hardened oil, said preservative being prepared by the steps comprising melting a hardened oil having a melting temperature of 40°–90° C., adding to said melted hardened oil maintained at a temperature not exceeding 90° C., sorbic acid powder in an amount of 1/10 to ½ of the weight of said hardened oil, dispersing the sorbic acid powder uniformly in the melted hardened oil at said temperature, and thereafter cooling the melted mixture by spraying it.

3,716,382
SLUSH-DRYING OF LIQUID FOODS
Santosh K. Chandrasekaran, Albany, and Cary Judson King III, Kensington, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
Filed June 24, 1970, Ser. No. 49,410
Int. Cl. A23b *7/02*
U.S. Cl. 99—205 1 Claim



Liquid foods are dehydrated by subjecting them to a vacuum and to a temperature only low enough to freeze part of the water content to produce a slush. A high drying rate, coupled with good flavor retention is provided.

3,716,383
APPARATUS FOR THE PRODUCTION OF SNACK FOOD
Koji Yamamura, 10-11, 1-chome, Minemachi, Chofu, Tokyo, Japan
Filed Sept. 25, 1970, Ser. No. 75,476
Int. Cl. A47j *37/12*; A23l *1/10*
U.S. Cl. 99—353 3 Claims



The material of food is first supplied into a supply source and is then divided into a proper amount by a rotary feed drum having several recesses for a further intermittent feed of the material through a guide hopper into an oil tank serving as a fry pan provided at the bottom of the apparatus. The fried material is continuously taken up for the edible oil with an action of a rotary vane and is then blown away by a blower onto an oil strainer means for removing the residual oil and finally the resultant snack food is collected in a container.

3,716,384

COMPOSITIONS FOR SEALING LEAKS IN VESSELS

Amos R. Anderson, Adrian, Mich., assignor to Joseph J. Packo Division of Ser. No. 7,210, Jan. 30, 1970, Pat. No. 3,634,560. This application May 12, 1971, Ser. No. 142,795

Int. Cl. C09k 3/10, 3/12

U.S. Cl. 106—33 4 Claims

The invention relates to compositions for sealing leaks in pipes, conduits, gas lines, closed containers, tanks and the like. The interior of such equipment is first purged with a non-reactive dry gas, such as nitrogen, to remove any moisture and/or oxygen which may be present. Then the sealant composition is introduced into the interior of the equipment in a suitable inert gas vehicle under pressure. The sealant composition in the gas vehicle will escape from any leaks present in the equipment into the adjacent external environment such as the outer ambient atmosphere or adjacent soil in the case of pipelines buried in soil. The sealant reacts with oxygen and/or moisture to form at the situs of the leak a solid reaction product.

The sealant compositions comprise pyrophoric volatilizable alkyl aluminum etherates. Illustrative examples are trimethylaluminum dimethyletherate, trimethylaluminum diethyletherate, and triethylalumin diethyletherate. These and similar compounds may be used singly or in mixtures thereof. They may also be mixed with volatile organo-silane compounds in amounts ranging from about 1 to 99 percent by volume. Specific illustrative organo-silane compounds are trimethyl ethoxy silane, dimethyl diethoxy silane, and propyl trimethoxy silane.

3,716,385

OPTICAL GLASSES COMPRISING AlF_3 HAVING A VARYING PARTIAL DISPERSION

Willy Ritze, Mainz-Mombach, Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Germany

Filed Apr. 6, 1970, Ser. No. 25,871

Claims priority, application Germany, Apr. 11, 1969, P 19 18 350.7

Int. Cl. C03c 3/00

U.S. Cl. 106—47 Q 3 Claims

Optical, fluorine-containing barium silicate or barium borosilicate glasses having a varying partial dispersion, characterized in that they consist essentially of:

	Wt. percent
SiO_2	15–45
B_2O_3	0–15
$SiO_2+B_2O_3$	30–47
BaO	25–56
BaF_2	0–10
$BaO+BaF_2$	35–56
AlF_3	3–18

3,716,386

PROCESS FOR DISPERSING FIBRE IN AN AQUEOUS MIX

Edward Kempster, Kings Langley, England, assignor to National Research Development, London, England

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,201

Claims priority, application Great Britain, Nov. 12, 1969, 55,419/69

Int. Cl. C04b 7/02

U.S. Cl. 106—90 8 Claims

A process for preparing a fibrous mix in which the fibre content of the mix is immersed in a solution of polyethylene oxide or methyl cellulose prior to its incorporation in the mix. Examples are described in which the basic constituent of the mix is cement or plaster and the fibres are glass fibres, steel wires, or nylon fibres.

3,716,387

CEMENT CLINKER PRODUCTION

Kenneth D. Simmons, New Canaan, Conn.; Henry W. Allen, Saverna Park, and Ronald F. Gebhardt, Randallstown, both of Md., and Hoke M. Garrett, Piedmont, Calif., assignors to Martin Marietta Corporation, New York N.Y.

Filed Dec. 16, 1970, Ser. No. 98,614

Int. Cl. C04b 7/28

U.S. Cl. 106—100 47 Claims

Calcareous rock having an appreciable kerogen content, forming up to 75 percent of kerogen-bearing limestone deposits and previously unsuited for use in cement producing operations, is roasted at 800°–1,600°F, preferably at 1,000°–1,350F, in an oxidizing atmosphere to reduce the kerogen content to tolerable levels and render the roasted rock suitable as kiln feed material for cement production operations. The entire kerogen-containing limestone deposit can thereby be effectively utilized in such operations.

The quality of the roasted rock as kiln feed material is enhanced by the entrainment of impurities in the air stream used to cool the roasted rock, in the roaster effluent gases and in the heated gas stream used for drying of the rock prior to roasting. The effluent gases from the roaster and heated air from the cooling zone can be employed for the drying of additional quantities of rock. By carrying out the primary crushing of the rock so as to minimize the production of limestone fines, thus minimizing the amount of limestone material removed from the treated rock with the impurity-laden fines entrained in said gas streams, the quality of the treated rock may be further enhanced. With raw rock from interbedded deposits having thin bands of limestone separated by thin bands of shale, a single roll crusher can be used to minimize the production of limestone fines. Sulfur is removed from the roasted rock without release of sulfur-containing gases to the atmosphere, such removal being enhanced at temperature above 1,000°F. At such temperatures, the kerogen content of the roasted rock is reduced to from about 0.8 to 1.5 percent by weight of rock. In the effective utilization of limestone deposits having both high quality rock with tolerable amounts of hydrocarbons and said rock with appreciable kerogen hydrocarbon content, the high kerogen material, previously unused, can be employed for about 50 to 90 percent of the calcareous material used in cement clinker production, thereby avoiding premature depletion of the high quality rock and assuring effective utilization of the entire deposit.

3,716,388

COLORING COMPOSITIONS

Benito Lopez, Parsippany, and Saul S. Kornblum, Springfield, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 748,593, July 30, 1968. This application Sept. 11, 1970, Ser. No. 71,428

Int. Cl. C08h 17/66; C08k 1/24

U.S. Cl. 106—289 13 Claims

A lake dye composition of a F.D. & C., D. & C. and External D. & C., or non-certified dye adsorbed on an insoluble fumed inorganic oxide substrate, e.g., titanium dioxide. It is useful for color coating pharmaceutical, cosmetic, food and other solid forms.

3,716,389

PIGMENT COMPOSITION AND ITS USE IN ELECTRODEPOSITION

Donald J. Voskuil, Muskego; John P. Knudtson, Milwaukee, and Myron J. Krupp, Grafton, all of Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 2, 1971, Ser. No. 112,090

Int. Cl. C09c 3/00

U.S. Cl. 106—309 10 Claims

When a mixture of dissimilar pigments are employed in an aqueous composition, for example, an electrodeposition bath,

pigment separation is frequently noted. It has now been found that by preparing two aqueous pigment portions such as (A) a pigment, an anion-active agent, and a soluble silicate; and (B) a pigment, a cation-active agent, and a soluble metal salt capable of forming an insoluble silicate and then mixing (A) and (B), thereafter forming a convention pigment, this problem is reduced or eliminated. The pigments prepared in this manner may be used as pigments in electrodepositable compositions.

3,716,390

PHOTORESIST METHOD AND PRODUCTS PRODUCED THEREBY

Victor Charles Garbarini, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 783,770, Dec. 13, 1968. This application May 27, 1970, Ser. No. 41,075

Int. Cl. B44d *1/02*

U.S. Cl. 117—34 **11 Claims**

The adherence of photoresist materials to many substrates is improved by use of a substrate primer of an ionic complexed compound capable of carrying an appropriate organo group for reaction with the photoresist, and capable of electrostatically migrating to the substrate for the formation of strong chemical bridges therewith.

3,716,391

PROCESS FOR GRAFT POLYMERIZATION ONTO ORGANIC MACROMOLECULAR MATERIALS

Kirokuro Hosoda, Yokohama-shi; Yoshio Kadowaki, Tokyo; Eisuke Oda, and Nobuo Hoshino, both of Yokohama-shi, all of Japan, assignors to The Furukawa Electric Company Limited, Chiyoda-ku, Yokyo, Japan

Filed Sept. 10, 1969, Ser. No. 856,643

Claims priority, application Japan, Sept. 14, 1968, 43/66276; Oct. 19, 1968, 43/76215

Int. Cl. B44d *1/092, 5/12*

U.S. Cl. 117—47 A **21 Claims**

A process for graft polymerization of monomers onto organic macromolecular solid materials which comprises activating a macromolecular shaped article having a specific surface area of less than 3800 cm^2/g with ozone under a condition of any point of the area defined by straight lines connecting p_1, c_1, c_{10}, p_{10} in the attached FIG. 1, and further bringing said ozone activated material into contact with one or more radical polymerizable monomers in the presence of one or more members selected from the group consisting of trimethylamine, propylamine, ethylenediamine, piperidine, piperazine, morpholine, ethanolamine, hydroxyethyl ethylenediamine, pyridine, formamide and dimethyl formamide.

3,716,392

COMPOSITIONS FOR AND METHODS OF IMPROVING ADHESION OF PLATED METAL ON PLASTIC SUBSTRATES

John J. Grunwald, New Haven, and Eugene D. D'Ottavio, Thomaston, both of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Division of Ser. No. 645,901, June 14, 1967, Pat. No. 3,579,365. This application May 11, 1970, Ser. No. 48,713. The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.

Int. Cl. B01j *13/00;* **B44d** *; G08h 9/00*

U.S. Cl. 117—47 A **9 Claims**

A method of and composition for promoting adhesion between plated metal and a plastic substrate, in which the active agent is provided in finely divided dispersed or colloidal form in an aqueous emulsion. The active agents are any of a group of low molecular weight organic unsaturated compounds of the fatty acid type, and more especially of the group of naturally occurring products such as linseed, tall, tung and castor oils, turpentine and similar wood rosins. These, when dispersed in water to provide stable emulsions, are used as a pretreatment bath for plastic substrates, prior to plating of the substrate, in order to promote the formation of a stronger bond between the metal plate and substrate.

3,716,393

PROCESS FOR ANTISTATICALLY TREATING ARTICLES

Robert L. Baker and Edward Szlosberg, Greenville, S.C., assignors to Phillips Fibers Corporation, Bartlesville, Okla.

Filed Feb. 8, 1971, Ser. No. 113,618

Int. Cl. B44d *1/092*

U.S. Cl. 117—47 R **5 Claims**

A process for treating an electrically chargeable article with an anionic resist-agent and thereafter treating the article with a cationic agent to condition said article for lower accumulation of static charges of electricity thereon.

3,716,394

PROCESS OF METAL PLATING HYDROHALOGEN POLYMER SURFACE

Terry B. Waggoner, Overland Park, Kans., and Edgar J. Seyb, Jr., Oak Park, Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 574,954, Aug. 25, 1966, Pat. No. 3,639,153. This application March 9, 1971, Ser. No. 122,516

Int. Cl. B23b *15/08;* **C23c** *3/02*

U.S. Cl. 117—47 A **1 Claim**

This invention relates to a method of modifying a hydrohalogen polymer surface wherein said hydrohalogen polymer is selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, and polyvinyl dichloride which comprises contacting the hydrohalogen polymer surface with an alkali metal alkoxide MOR wherein M is an alkali metal and R is an alkyl group at a temperature of 2° to 106° C for a time increment of 5 minutes to 300 minutes thereby forming an alkoxide-activated surface thereof; contacting said surface with an oxygen-containing oxidizing agent of sufficient strength to convert an olefinic double bond to the corresponding aldehyde or carboxyl group to form an oxygen-activated, alkoxide-activated surface; and electrolessly depositing onto said surface a metal deposit.

3,716,395

PROCESS OF PRODUCING PIGMENTED, A HARDENABLE RESIN CONTAINING PAPER SHEETS, AND PRODUCTS

Hans Bauer, Ulm-Wiblingen; Helmut Holzer, Neu-Ulm/Donau, both of Austria, and Gerhard Schmidt, Altheim ob Weithung, all of Germany, assignors to Sued-West-Chemie GmbH, Neu-Ulm/Donau, Germany

Filed Oct. 31, 1968, Ser. No. 772,400

Claims priority, application Germany Oct. 31, 1967, P 16 96 261.1

Int. Cl. B05c *9/04*

U.S. Cl. 117—68 **10 Claims**

A paper sheet is impregnated with a hardenable resin and a pigment and is coated with a mixture of a hardenable resin, a pigment, and a plasticizer. It may additionally be provided with a substratum layer of a hardenable resin on the surface opposite the coated surface. Such a paper sheet can be attached to a suitable base or carrier material by hot pressing. The paper sheet of this invention has the advantage over the heretofore used, simply coated paper sheet that the basis weight of the paper and the amount of impregnating resin can be reduced, that the paper, after pressing, has a higher degree of flexibility, that its craze and crack resistance is considerably improved, and that its hiding, masking, or covering power is superior to that of heretofore produced pigmented and resin

coated paper sheets so that light color shades of the resulting laminated articles can be produced in a simple and inexpensive manner. The preferred hardenable impregnating and coating resin in a melamine-urea-formaldehyde resin.

3,716,396

PROCESS FOR PRODUCING POLYESTERS OF IMPROVED RUBBER ADHESION AND PRODUCT

Kenji Shirano, and Toshihiko Yoshitake, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed April 15, 1971, Ser. No. 134,418
Int. Cl. B32b *25/08, 27/36*
U.S. Cl. 117—76 T 20 Claims

Rubber adhesion properties of fibrous polyester materials are improved by a process which comprises applying a solution of an amine compound, such as polyethylene imine, to said fibrous material, subjecting the resulting fibrous material to heat treatment and then treating said fibrous material with an organic solvent solution of a polycarboxylic acid halide such as adipic acid dichloride.

3,716,397

TREATING MICROPOROUS MATERIAL

Frank Peter Civardi, 98 Kiwanis Drive, Wayne, N.J., and Hans-George Kuenstler, 149-32 12th Road, Whitestone, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,290
Int. Cl. B44d *1/02*
U.S. Cl. 117—77 18 Claims

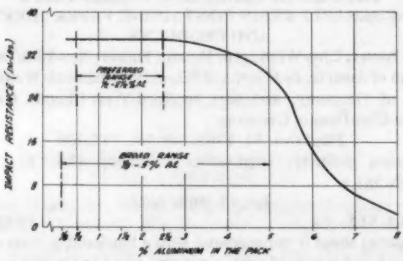
Microporous elastomeric sheet material, suitable for use in making shoe uppers, is pigmented throughout its thickness by impregnating it with a dilute aqueous pigmented latex, to deposit pigment within the micropores. Preferably the latex is anionic and the impregnated sheet is treated with acid; this produces a pigmented sheet of superior uniformity.

3,716,398

IMPACT RESISTANT COATINGS FOR NICKEL-BASE AND COBALT-BASE SUPERALLOYS AND THE LIKE

Richard J. Stueber, Suffern, N.Y., and Stanley J. Klach, Riverdale, N.J., assignors to Chromalloy American Corporation, Orangeburg, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,147
Int. Cl. C23c *9/02*
U.S. Cl. 117—107.2 P 3 Claims



In the production of impact and oxidation resistant nickel-base metal coatings on heat resistant superalloys by pack aluminizing in which nickel aluminide is formed to provide the protective coating, markedly improved ductile coatings are produced of high impact resistance by controlling the amount of aluminum in the pack which also contains about 5 to 40 percent by weight of chromium, the amount of aluminum not exceeding 3 percent by weight of the pack.

3,716,399

WATER-REPELLENT COMPOSITION FOR TREATING BUILDING MATERIALS

Siegfried Nitzsche; Ewald Pirson, and Michael Roth, all of Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Bavaria, Germany

Continuation-in-part of Ser. No. 772,854, Nov. 1, 1968, abandoned. This application Dec. 3, 1970, Ser. No. 94,981
Claims priority, application Germany, Nov. 3, 1967, W 45102
Int. Cl. C04b *41/28;* C08g *47/10*
U.S. Cl. 117—123 D 7 Claims

A mixture of methylpolysiloxanes and polymethylmethacrylate or vinylchloride copolymers in organic solvent is employed to impart water-repellency to masonry and gypsum-based building materials, inter alia.

3,716,400

COATING PROCESS FOR METAL CONTAINERS

Joseph J. Tryzna, Evergreen Park, and George L. Becker, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

No Drawing. Original application Dec. 12, 1967, Ser. No. 689,789, now Patent No. 3,513,115. Divided and this application Mar. 5, 1970, Ser. No. 26,448
Int. Cl. B44d *1/36.* C09d *3/58*
U.S. Cl. 117—132 BE 2 Claims

A process for coating a sheet metal substrate for metal food containers comprising applying to said metal substrate a dispersion in a volatile organic solvent of (1) an organosol film component composed of (a) a dispersion grade vinyl chloride homopolymer; (b) a solution grade vinyl chloride copolymer resin, and (c) a plasticizer; (2) an adhesion promoting component comprised of a methylol phenol ether and a low molecular weight epoxy resin; and (3) a heat stabilizing component of a triazine-aldehyde resin and an epoxidized triglyceride and drying and curing the coated substrate.

3,716,401

PROCESS RENDERING VINYL SURFACES SOIL RESISTANT

Robert Jay Axelrod, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1971, Ser. No. 171,307
Int. Cl. B44d *5/00;* B32b *27/08*
U.S. Cl. 117—138.8 UA 6 Claims

A process for rendering vinyl surfaces resistant to soiling and readily cleanable by application thereto of a polymeric surface coating comprising a vinyl polymer in a volatile solvent and from about 0.2 percent to about 0.7 percent by weight of carboxylic esters of 2-perfluoroalkylethanol having the formula $C_nF_{2n+1}CH_2CH_2OH$ wherein n is from 6 to 14.

3,716,402

FILM FORMING COMPOSITONS FROM POLYCARBOXYLIC ACIDS AND ADDUCTS OF POLYEPOXIDES AND AMINES

Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Coatings Company, New York, N.Y.

Continuation-in-part of Ser. No. 806,727, March 12, 1969, abandoned. This application May 24, 1971, Ser. No. 146,494
Int. Cl. C09d *3/58;* B44d *1/36*
U.S. Cl. 117—161 LN 11 Claims

A curable coating composition having utility when applied as a film to a substrate from an aqueous solution is prepared from a mixture of (1) the reaction product of a polyfunctional epoxide compound and a primary amine with (2) a polycarboxylic acid or acid anhydride and, in some cases (3) an aminoplast resin.

3,716,403
METHOD OF MAKING SEMI-CONDUCTIVE CATHODES

Leon Braun, Linden, N.J., assignor to Molecular Energy Corporation, Livingston, N.J.

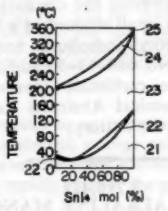
Filed Oct. 20, 1969, Ser. No. 867,922
Int. Cl. H01j 9/00
U.S. Cl. 117—201 **16 Claims**

The cathodes produced by the methods of this invention have relatively good conductivity and have a high proportion of energy productive materials and a significantly low proportion of non-energy productive materials. The method of producing such cathodes involves coating particles of metallic halides or oxides of copper, nickel, iron, silver or lead with a metallic sulfide and locating a plurality of the resulting coated particles so that substantially each coated particle of the plurality contacts at least one other coated particle of such plurality.

3,716,404
PROCESS FOR DOPING WITH IMPURITIES A GAS-PHASE-GROWN LAYER OF III-V COMPOUND SEMICONDUCTOR

Motohisa Hirao, and Yutaka Takeda, both of Tokyo, Japan, assignors to Mitachi, Ltd., Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,474
Claims priority, application Japan, March 2, 1970, 45/17777; Sept. 12, 1969, 44/71995
Int. Cl. B44d 1/02; H01l 7/36
U.S. Cl. 117—201 **16 Claims**



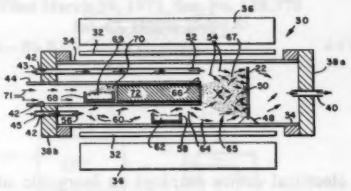
A process for doping a semiconductor material with an impurity source of SnI_4, $SnBr_4$, GeI_4, $GeBr_4$, combinations thereof or a mixture of S and S_2Cl_2 by vaporizing the impurity source at a temperature of from 0° to 20°C. and then transferring the vapor with a carrier gas into contact with a semiconductor layer composed of a III–V compound in the course of its gas-phase growth. In this manner, it is possible to regulate the concentration of doping impurity, such as Sn, Ge or S, over a full range of lower concentrations (such as 10^{15}–10^{18} cm^{-3}) with semiconductor materials such as GaAs, GaP, GaPAs and InAs.

3,716,405
VAPOR TRANSPORT METHOD FOR GROWING CRYSTALS

Mahn-Jick Lim, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 78,445
Int. Cl. C23c 17/02
U.S. Cl. 117—201 **44 Claims**

Single crystals of either III–V or II–VI compounds are deposited on a heated substrate using a heated liquified mass of the metallic constituent (Group III or II), a hydrogen compound of the Group V or VI element and wet hydrogen as source materials within an open reaction tube at an elevated temperature. In a preferred embodiment single crystal GaP is grown using heated liquid gallium (Ga), phosphine (PH_3) and wet hydrogen (H_2O and H_2) as source materials. The wet hydrogen is passed over the liquid gallium to generate a gallium sub-oxide (Ga_2O) stream while the temperature of the tube decomposes the phosphine to P_2 and H_2 in a stream. The P_2- and Ga_2O-containing streams are mixed but they reach the heated substrate whereat the single crystal gallium phos-

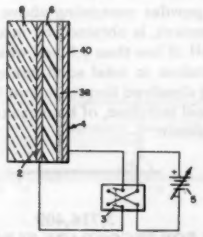


phide is grown. Thermodynamic analysis yields permissible ranges for the partial pressures of the P_2, the Ga_2O, and H_2O (from which are derived the inlet pressures of the PH_3 and the H_2O+H_2) and for the temperature of the liquid Ga and of the substrate. Uniform, large area single crystals (e.g., GaP) grown in this manner contain high amounts of electrically active dopants (e.g., oxygen) and are usable as efficient photo- and electro-luminescent devices.

3,716,406
METHOD FOR MAKING A CADMIUM SULFIDE THIN FILM SUSTAINED CONDUCTIVITY DEVICE

Ronald F. Scholl, Malibu, and William P. Bleha, Jr., Santa Monica, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 4, 1971, Ser. No. 140,086
Int. Cl. B44d 1/18
U.S. Cl. 117—217 **14 Claims**



A solid state electrical device which exhibits the property of having different and sustained states of electrical conductivity and method for making same is disclosed. More particularly, a method is disclosed for fabricating an improved solid state thin film electronic storage medium which can retain by conductivity modulation a high resolution image momentarily impressed thereupon by means of either optical or electron beam inputs for an extended period of time (several tens of seconds) provided that an applied electric field is maintained across the solid state element. This phenomenon is hereinafter referred to as "field sustained conductivity." Removal or reversal of the applied electrical field restores the solid state element to its normally insulating condition.

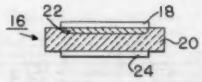
3,716,407
ELECTRICAL DEVICE HAVING OHMIC OR LOW LOSS CONTACTS

Manfred Kahn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Original application Sept. 23, 1969, Ser. No. 860,343. Divided and this application May 21, 1971, Ser. No. 145,948

Int. Cl. B44d 1/02; H01l 3/00

U.S. Cl. 117—224 5 Claims



An electrical device employs an inorganic substrate of the type having a highly electronegative element at least on the surface thereof. The substrate is selected from the group consisting of an insulator and a semi-conductor. In ohmic or low loss contact with said substrate is at least one electrode consisting essentially of a mixture of (1) a metal selected from a first group consisting of the platinum group metals, gold, silver and mixtures thereof and (2) a metal in in-situ oxidized form with at least some of the electronegative element of said substrate, said metal being at least one selected from a second group consisting of calcium, magnesium, barium, strontium, zinc, tin, vanadium, nickel, indium, titanium and chromium.

3,716,408
PROCESS FOR PREPARING A LACTULOSE POWDER

Taro Nagasawa; Takuji Kawashima, both of Tokyo; Koyoshi Suzuki, Taniyama, and Kouzo Kawase, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1971, Ser. No. 185,885

Claims priority, application Japan, May 31, 1971, 46/37019

Int. Cl. C13k 9/00

U.S. Cl. 127—46 R 1 Claim

A lactulose powder containing above 55 percent of lactulose in solid content, is obtained by mixing an aqueous solution having a pH of less than 7.0 and which contains above 60 percent of lactulose in total solid content, with an aqueous solution having dissolved therein, about 0.3 percent, based on the weight of said lactulose, of konnayaku powder, and drying the resulting mixture.

3,716,409
CATHODES FOR SECONDARY ELECTROCHEMICAL POWER-PRODUCING CELLS

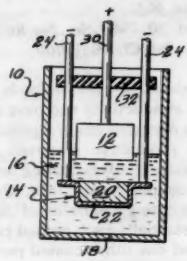
Elton J. Cairns, Downers Grove, Martin Kyle, Wheaton, and Hiroshi Shimotake, Hindsdale, all of Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 8, 1971, Ser. No. 178,577

Int. Cl. H01m 35/00

U.S. Cl. 136—6 22 Claims

A secondary electrochemical power-producing cell including an anode containing lithium, an electrolyte containing lithium ions, and a cathode containing sulfur. The cathode comprises plates of a porous substrate material impregnated with sulfur alternating with layers, which may also comprise porous substrate plates, containing electrolyte. The cathode may further be encased in additional electrolyte-impregnated porous material. The cathode may also comprise a metal housing having an orifice at one end, a plate of porous substrate material impregnated with sulfur sealing the orifice, and a layer of electrolyte-impregnated porous substrate material mounted on the exterior surface of the sulfur-impregnated plate, liquid sulfur being located within the housing enclosure.



3,716,410
LITHIUM BATTERY ELECTROLYTE ADDITIVE AND METHOD OF IMPROVING DISCHARGE RATE

James N. Butler, Wayland, and David R. Cogley, Hollliston, Mass., assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Sept. 27, 1971, Ser. No. 184,224

Int. Cl. H01m 11/00

U.S. Cl. 136—6 4 Claims

A method for improving the discharge rate of lithium batteries by adding a small amount of a hexamethyl phosphoramide (hexamethyl-phosphoric triamide; Chemical Abstracts Registery No. 680–31–9) additive to the lithium perchlorate-propylene carbonate (carbonic acid, cyclic propylene ester; Chemical Abstracts Registry No. 108–32–7) electrolyte of the battery.

3,716,411
RECHARGEABLE ALKALINE MANGANESE CELL

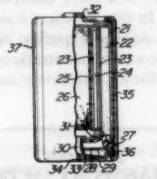
Hiromichi Ogawa, Moriguchi, Tsukasa Ohira, Nara, Kaoru Murakami, Hirakata, and Takao Yokoyama, Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1971, Ser. No. 111,069

Claims priority, application Japan, Feb. 2, 1970, 45/9,111

Int. Cl. H01m 43/02

U.S. Cl. 136—30 3 Claims



A rechargeable alkaline manganese cell wherein manganese dioxide is used as a positive electrode active material, zinc is used as a negative electrode active material and alkaline aqueous solution mainly composed of potassium hydroxide is used as an electrolyte and the discharge capacity of the negative electrode is controlled within such a range that the positive electrode can be reversed to non-discharge state by charging after discharging and said positive and negative electrodes face in their opposite sides through a mat-like separator of a given thickness therebetween.

3,716,412
ELECTRIC STORAGE BATTERIES

Kenneth Peters, Walkden, England, assignor to Electric Power Storage Limited, Swinton, Manchester, England

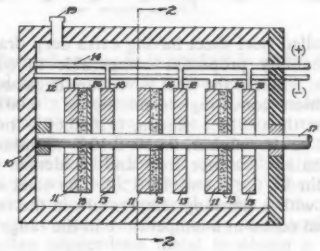
No Drawing. Filed Feb. 19, 1971, Ser. No. 117,119
Int. Cl. H01m *9/00, 35/30*
U.S. Cl. 136—34 **6 Claims**

A lead acid battery having an improved acid electrolyte is disclosed. The electrolyte in the battery contains not more than 75 grams of amorphous silica (calculated as SiO_2) per litre of electrolyte whereby the resistance to shedding of active material from the positive electrode of the battery is enhanced.

3,716,413
RECHARGEABLE ELECTROCHEMICAL POWER SUPPLY

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Filed July 15, 1970, Ser. No. 54,887
Int. Cl. H01m *29/04, 31/02*
U.S. Cl. 136—86 A **10 Claims**

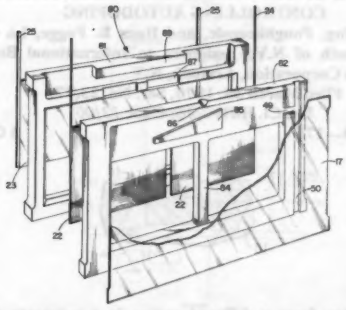


This invention relates to an improvement in zinc-air and other rechargeable electric storage cells whereby the zinc-electrode surface is mechanically activated allowing the cell to be recharged very rapidly without the growth of dendrites on the zinc plates.

3,716,414
100-WATT FUEL CELL

Max Goldberger, Wapping, Conn., assignor to Catalytic Technology Corporation, Manchester, Conn.

Filed Aug. 12, 1970, Ser. No. 63,070
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 R **4 Claims**

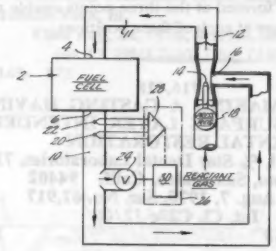


A commercially useful and marketable fuel cell is described. The cell is capable of operating at ambient conditions of temperatures, pressure and the like for long periods of time. The complete cell includes one or more banks of individual cells, each cell including an anode, an air breathing catalytic cathode, and means for controlled feed of fuel and an aqueous electrolyte. The catalytic electrodes may be catalytic silver. A 100-watt commercial fuel cell is described.

3,716,415
FUEL CELL ELECTROLYTE CONCENTRATION CONTROL

Richard N. Gagnon, Glastonbury; Carl V. Banic, Cromwell, and Albert P. Grasso, Vernon, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed March 29, 1971, Ser. No. 128,775
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 B **4 Claims**

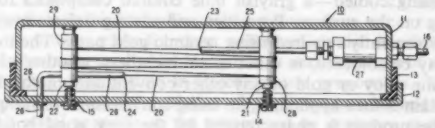


A fuel cell electrolyte concentration control is provided by wet bulb and dry bulb temperature sensors disposed downstream of a fuel cell in a reactant gas recirculation conduit; excess electrolyte diluent removal means are provided and are controlled by control means as a function of the difference between the sensed dry bulb and wet bulb temperatures.

3,716,416
FUEL METERING DEVICE FOR FUEL CELL

Otto J. Adlhart, Newark, and Peter L. Terry, Madison, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation

Filed May 20, 1971, Ser. No. 145,287
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 B **4 Claims**



A fuel cell system designed for self-regulated power output at a predetermined level includes a capillary flow control device for throttling the fuel flow in response to the power output of the fuel cell.

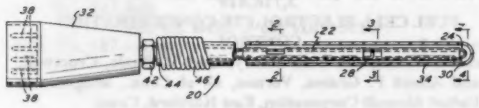
3,716,417
PROFILE THERMOCOUPLE

Harry T. Evans, Philadelphia, Pa., assignor to Pyco, Inc., Penndel, Pa.

Filed Dec. 24, 1970, Ser. No. 101,220
Int. Cl. H01v *1/02*
U.S. Cl. 136—232 **3 Claims**

A profile thermocouple is provided for measuring temperature at a plurality of spaced points preferably in a diffusion furnace. The thermocouple includes a thermocouple lead of a first polarity and three thermocouple leads of a second polari-

ty. Each of the leads of the second polarity are connected to the thermocouple lead of the first polarity at junctions which



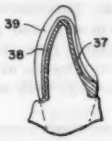
are spaced along the length of the lead of the first polarity so that the junctions formed at the three points enable measurement of temperature at each of these positions.

3,716,418

METHOD OF MAKING A CASTING HAVING AN OXIDIZED SURFACE LAYER INTENDED FOR USE AS A DENTAL RESTORATION

Jacob Kochavi, % Star Dental Laboratories, 718 El Camino, San Mateo, Calif. 94402

Filed Aug. 7, 1970, Ser. No. 61,917
Int. Cl. C23c *11/00*
U.S. Cl. 148—6.3 **1 Claim**



A restoration is made using an alloy of approximately 80% Ni–20% Cr employing conventional casting techniques heretofore used with precious metals. After the casting has been cleaned it is heated under vacuum commencing at 1400–1500° F. and increasing gradually to approximately 1950° F. The vacuum is released and the casting cooled—a grayish blue colored compound forming on the surface. Porosities and casting defects may be conveniently repaired using ceramic gold paste. The metal may be soldered, to other metal members, whether of the same alloy or gold or any other conventional metal. Porcelain is then applied, again using conventional techniques. The product is characterized by the very good bond of porcelain to metal, extreme dimensional accuracy and relatively low cost of metal.

3,716,419

PREPARATION OF ALUMINUM HAVING BLOCK TEXTURE

Francois Regis Boutin, rue de la Gare, 38-Virieu-sur-Bourbre, France

Filed Aug. 20, 1971, Ser. No. 173,698
Claims priority, application France, Nov. 16, 1970, 7040921
Int. Cl. C22f *1/04*
U.S. Cl. 148—11.5 A **5 Claims**

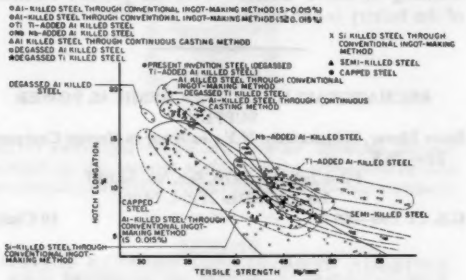
A process for the production of thin aluminum strips or sheets having a thickness less than 0.2 mm comprising the steps of hot rolling, cold rolling and recrystallization annealing wherein the aluminum strips or sheets are subjected to cold rolling, annealing and cold working between hot rolling and final recrystallization annealing.

3,716,420

HOT ROLLED STEEL SHEETS FOR EXTRA DEEP DRAWING

Kazuo Matsudo, Koichi Osawa, and Yoshisuke Ikegami, Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Nov. 8, 1971, Ser. No. 196,697
Claims priority, application Japan, Dec. 19, 1970, 45/113,660
Int. Cl. C21d *1/74, 9/48*
U.S. Cl. 148—12 **3 Claims**


●Al–KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD (S>0.015%)
◎Al–KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD (S≦0.015%)
○Ti–ADDED Al KILLED STEEL
⊙Nb–ADDED Al KILLED STEEL
Al KILLED STEEL THROUGH CONTINUOUS CASTING METHOD
●DEGASSED Al KILLED STEEL
●DEGASSED Ti KILLED STEEL
●PRESENT INVENTION STEEL (DEGASSED Ti–ADDED Al–KILLED STEEL)
Al–KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD
DEGASSED Ti KILLED STEEL
Al–KILLED STEEL THROUGH CONTINUOUS CASTING METHOD
X Si KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD
▲ SEMI-KILLED STEEL
■ CAPPED STEEL
DEGASSED Al KILLED STEEL
Nb–ADDED Al–KILLED STEEL
Ti–ADDED Al–KILLED STEEL
SEMI–KILLED STEEL
CAPPED STEEL
Al–KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD (S 0.015%)
Si–KILLED STEEL THROUGH CONVENTIONAL INGOT-MAKING METHOD
NOTCH ELONGATION
TENSILE STRENGTH kg/mm²

A hot rolled steel sheet having extra deep drawing and press formability properties comparable to cold rolled steel sheets, wherein the steel is vacuum degassed and has a composition consisting essentially of: 0.001–0.020% carbon, less than 0.10% silicon, 0.10–0.60% manganese, less than 0.020% sulphur, 0.010–0.10% aluminum, 0.02–0.08% titanium, balance iron and incidental impurities and wherein $Ti/C<4$ and $Ti/S>2$. The steel sheets are hot rolled with a finishing temperature in the range 800–950° C. and coiled at a temperature in the range 650° C.–700° C.

3,716,421

COMPOSITIONS FOR IMPROVED SOLDERABILITY OF COPPER

John H. Burkhart, and Edward C. Slick, both of Warren, Pa., assignors to GTE Sylvania Incorporated

Filed March 19, 1971, Ser. No. 126,199
Int. Cl. C23f *7/00*
U.S. Cl. 148—6.14 R **3 Claims**

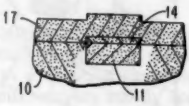
The solderability of copper and copper alloys is improved by applying a composition comprising certain triazole compounds, a carrier to impart a uniform coating on the material to be soldered and a solvent for the triazole and the carrier.

3,716,422

METHOD OF GROWING AN EPITAXIAL LAYER BY CONTROLLING AUTODOPING

David W. Ing, Poughkeepsie, and Hans B. Pogge, La Grangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 30, 1970, Ser. No. 23,772
Int. Cl. H01l *7/36*; C23c *13/00*
U.S. Cl. 148—175 **5 Claims**



Autodoping from a diffused region in a substrate during growth of an epitaxial layer is prevented by growing a thin epitaxial layer over the entire surface of the substrate and then removing the epitaxial layer except for the portion over the diffused region. A second epitaxial layer is then grown over the surface of the substrate and the first epitaxial layer. The

first epitaxial layer caps the diffused region to prevent autodoping into the second epitaxial layer during growth thereof over the surface of the substrate not having the diffused region therein.

3,716,423

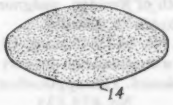
HOT-FORMED COPPER-BASE PRODUCT

Daniel B. Cofer, Carrollton, Ga., assignor to Southwire Company, Carollton, Ga.

Continuation-in-part of application Ser. No. 633,670, Apr. 18, 1967, which is a continuation-in-part of application Ser. No. 498,773, Oct. 20, 1965. This application is also a continuation-in-part of application Ser. No. 816,127, Apr. 14, 1969, which is a continuation of application Ser. No. 613,245, Feb. 1, 1967, which in turn is a division of application Ser. No. 390,666, Aug. 19, 1964, now Patent No. 3,317,994. This application Feb. 2, 1970, Ser. No. 7,779

Int. Cl. C22f *1/08*

U.S. Cl. 148—32 **1 Claim**



A hot-formed copper-base product in which the copper-base metal has copper oxide inclusions which are substantially uniformly dispersed and has a substantially uniform fine grain structure. In the form of a rod of tough pitch copper, the hot-formed copper-base product is superior to prior art hot-formed copper-base products for drawing into wire and for other uses. The hot-formed copper-base product is produced in the form of a rod of tough pitch copper by substantially completely solidifying a molten copper-base metal to obtain a cast metal and by hot-forming the cast metal into rod, the hot-forming being initiated while the cast metal is in substantially that condition in which it solidified and being of sufficient degree to substantially completely destroy the columnar dendritic structure of the cast metal.

3,716,424

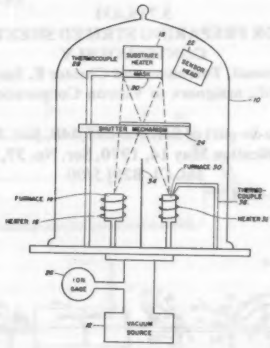
METHOD OF PREPARATION OF LEAD SULFIDE PN JUNCTION DIODES

Richard B. Schoolar, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 2, 1970, Ser. No. 24,983

Int. Cl. H01l *7/00*; **B01j** *17/00*; **G03g** *5/02*

U.S. Cl. 148—175 **6 Claims**



Flat, uniform planar diodes of PbS are prepared by either (1) epitaxially growing an n-type layer onto a p-type layer by depositing one layer epitaxially onto the other in a vacuum of at least 5×10^{-6} Torr wherein the substrate is at a temperature between 200–350° C and the material to be deposited is at a temperature not lower than its sublimation point or (2) epitaxially growing a p-type layer on an n-type layer using the procedure described in (1) with the addition of vapors of a doping agent such as S, Se or Te, in the system. This method may also be applied to the closely related compounds $Pb_xSn_{1-x}Se$ and $Pb_xSn_{1-x}Te$ where x varies from 0 to 1 inclusive, hereinafter referred to as the lead-tin salt alloys.

3,716,425

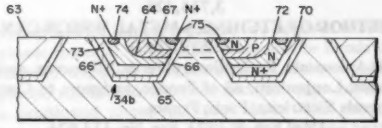
METHOD OF MAKING SEMICONDUCTOR DEVICES THROUGH OVERLAPPING DIFFUSIONS

Uryon S. Davidsohn, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 24, 1970, Ser. No. 66,163

Int. Cl. H01l *7/00, 7/64, 11/00*

U.S. Cl. 148—175 **5 Claims**



An integrated device and/or circuit and the method for making such is disclosed employing a plurality of fully insulated islands having plane walls. Selected diffusion steps are made overlapping certain of the islands and certain of the other diffusion steps.

3,716,426

MIXTURE OF A RADIOACTIVE TRACER SUBSTANCE AND A PROPELLENT FOR MARKING DRILLING TOOLS FOR DEEP WELLS AND SIMILAR BOREHOLES

Herbert Becker, Frankfurt/Main, Germany, assignor to Farbwerke Hoechst Aktengesellschaft vormals Meister Lucius Bruning, Frankfurt/Main, Germany

Filed June 2, 1969, Ser. No. 829,808

Int. Cl. C06b *15/00*

U.S. Cl. 149—38 **2 Claims**

For the expulsion of radioactive indicators from tracer cavities in drilling tools for deep wells and similar boreholes propellants are used which do not react with the water of the circulating drilling fluid in stoichiometric proportions. The propellents consist of a mixture of aluminum powder and an alkali metal peroxide as the primer and an explosive as the gas-yielding component. Ammonium picrate may be used with special advantage as the gas-yielding component.

3,716,427

METHOD OF PRODUCING TARNISH RESISTANT COPPER AND COPPER ALLOYS AND PRODUCTS THEREOF

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation

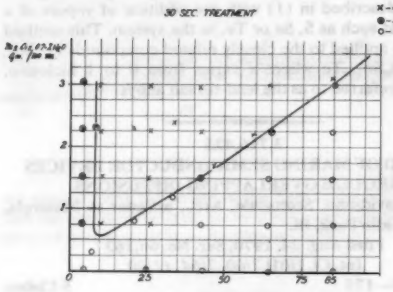
Continuation-in-part of application Ser. No. 59,684, July 30, 1970, now Patent No. 3,677,828. This application Aug. 28, 1970, Ser. No. 67,943

Int. Cl. H05k *3/06*

U.S. Cl. 156—3 **14 Claims**

A method of producing a laminate having high bond strength and excellent resistance to acid undercutting comprising applying a phosphoric acid solution containing a dichromate to copper or its alloys, rinsing, drying, and adhesively laminating to a plastic film. The instant case

also teaches a method of producing a high tarnish resistant copper and copper alloy by so treating, as well as a flexible



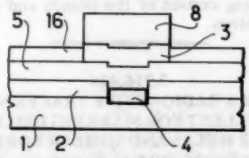
printed circuit characterized by high bond strength and the absence of acid undercutting.

3,716,428

METHOD OF ETCHING A METAL WHICH CAN BE PASSIVATED

Claude Amouroux, Paris; Gerard Peres, Villepreux, and Pierre Valette, Lonjumeau, all of France, assignors to Compagnie Generale Electricite, Paris, France

Filed Feb. 9, 1971, Ser. No. 113,924
Claims priority, application France, Feb. 9, 1970, 7004491
Int. Cl. B44c 1/22; B44d 1/18; H01l 7/00
U.S. Cl. 156—3 **5 Claims**



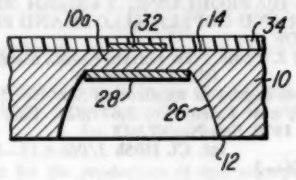
A process for etching a first metal which can be passivated, wherein a layer of a second metal which is more oxidizable than the first metal is deposited on the first metal, and the first metal and second metal layer are thereafter immersed in an acid solution.

3,716,429

METHOD OF MAKING SEMICONDUCTOR DEVICES

Louis Sebastian Napoli, Hamilton Square, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corp.

Filed June 18, 1970, Ser. No. 47,425
Int. Cl. H01l 7/00
U.S. Cl. 156—17 **9 Claims**



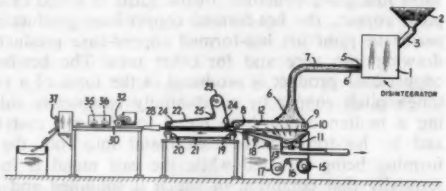
Semiconductor devices having thin bodies of a semiconductor material are made from a wafer of the semiconductor material which is thicker than the bodies of the devices. The thicker wafer is provided with spaced thinner portions of the desired area and thickness of the bodies of the devices to be formed by etching recesses in one surface of the wafer. The recesses are formed with flat bottoms which are of the desired area of the bodies of the devices. A masking layer is coated on the bottom of each of the recesses. The active region of each of the devices is formed at the other surface of the wafer over each of the recesses. The semiconductor material between the thin portions of the wafer is then removed by etching the wafer from the one surface of the wafer so as to separate the thin portions of the wafer to form the individual devices. During the last etching process the masking layers on the bottom of the recess protect the thin portions of the wafer from being etched.

3,716,430

TAMPON AND PROCESS AND APPARATUS FOR MAKING THE SAME

Ingemar Croon, Alfredshem, and Nils Verner Blomqvist, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Division of Ser. No. 662,843, Aug. 15, 1967, Pat. No. 3,523,535, which is a continuation-in-part of Ser. No. 606,956, Jan. 3, 1967, abandoned. This application Oct. 15, 1969, Ser. No. 871,131
Int. Cl. A61f 13/20
U.S. Cl. 156—62.4 **5 Claims**



A composite tampon is provided comprising an absorbent layer of cellulose pulp fibers, preferably cellulose fluff fibers, enclosed within a wrapper layer which can be a non-woven material, or a laminate between nonwoven material and cellulose pulp tissue.

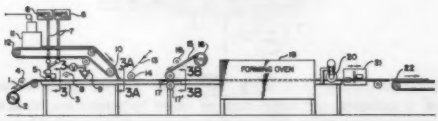
Apparatus is also provided for preparing such tampons in a continuous manner from cellulose fluff fibers and the wrapper materials, folding or rolling the absorbent layer within the wrapper in the form of a continuous elongated tampon, and then cutting the column into lengths to form the tampon.

3,716,431

PROCESS FOR PREPARING STRIPED SHEET MATERIAL CONTINUOUSLY

John K. Townsend, Torrance, and Chester E. Sanford, Lomita, both of Calif., assignors to Vistron Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 695,448, Jan. 3, 1968. This application May 14, 1970, Ser. No. 37,172
Int. Cl. B29j 5/00
U.S. Cl. 156—62.4 **7 Claims**



A process and apparatus are provided for the continuous manufacture of novel, fiber-reinforced, thermoset plastic

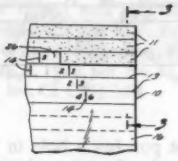
sheet material having longitudinal, substantially parallel colored or pigmented stripes as an integral part of the sheet material.

3,716,432

METHOD OF MAKING DECORATIVE ARTICLES EMPLOYING STRIPS OF FLEXIBLE MATERIAL

John R. Morrison, 350 E. 52nd St., New York, N.Y. 10022

Filed Mar. 3, 1971, Ser. No. 120,571
Int. Cl. B44d 5/06
U.S. Cl. 156—63 13 Claims



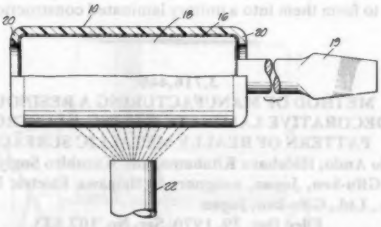
A base is provided having a pressure-sensitive adhesive coating on its surface. A portion of a narrow strip of flexible material is applied to the base surface, the remainder of the strip being held away from the surface. A knife blade is pressed against the strip to sever the adhered portion from the remainder. The base may bear indicia to indicate where the strip is to be placed and cut, and the type (e.g. color) of strip to be used. These steps are repeated using other strips, each strip being contiguous with at least one strip preceding it. A visual characteristic, such as color, of some strips differs from that of others of the strips, so that together all the strips produce a composite decorative effect. At least some of the strips are aligned with one or more other strips and arranged end-to-end with the other strips, and at least some are arranged side-by-side and parallel to other strips. The base may be rigid or flexible.

3,716,433

METHOD OF EQUIPPING A TOOL HANDLE OR HAND GRIP WITH A TOUGH ADHERENT PROTECTIVE LAYER WITH ENHANCED GRIPPING PROPERTIES

Walter A. Plummer, 3546 Crownridge Drive, Sherman Oaks, Calif.

Filed Sept. 18, 1970, Ser. No. 73,492
Int. Cl. B29c 27/10
U.S. Cl. 156—85 6 Claims



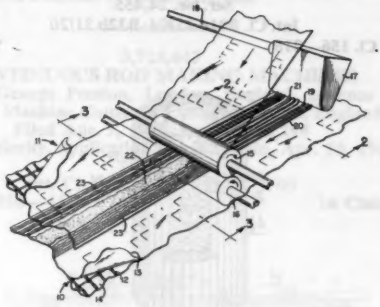
A method of providing a tool handle or the like hand grip with a tough protective strong-gripping layer by shrinking and bonding a sleeve of heat-reactive thermoplastic material thereto.

3,716,434

SEAL FOR PLASTIC SHEETING

Charles A. Cook, and David H. Campbell, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Division of Ser. No. 671,263, Sept. 28, 1967, Pat. No. 3,578,543. This application July 2, 1970, Ser. No. 60,972
Int. Cl. B65h 69/02
U.S. Cl. 156—157 3 Claims



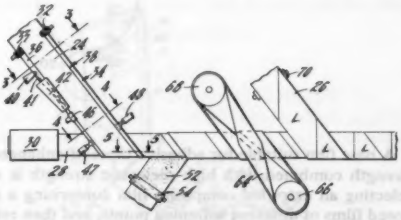
An overlap seal for joining together two edges of reinforced thermoplastic material. A plurality of strands or bands of hot melt adhesive are applied adjacent the edge of the one sheet of thermoplastic reinforced material and the edge of another sheet is positioned above the first sheet. The sheets are brought together and pressure is applied so that the heat contained in the hot melt adhesive causes a fusion of the two edges of thermoplastic to create a high strength bond. Some of the bands of thermoplastic material flow together to form a wide band with narrower bands on each side to provide an overlapped seal having increased strength.

3,716,435

METHOD OF MAKING A CONTAINER BODY

Stephen F. Jensen, Bronx, N.Y., and William A. Meyer, South Salem, both of N.Y., assignors to American Can Company, New York, N.Y.

Division of Ser. No. 764,273, Oct. 1, 1968, Pat. No. 3,540,490. This application Nov. 16, 1970, Ser. No. 89,851
Int. Cl. B31c 3/04
U.S. Cl. 156—195 1 Claim



A tubular, spirally wound multi-ply container body includes a body ply of fiber stock which has a liquidproof barrier layer prelaminated or otherwise preaffixed to one surface thereof. Material on the reverse side of both marginal edge portions of the resultant laminated ply is removed by a skiving operation, thereby reducing the thickness of the marginal edge portions. One of the thinned, skived, marginal edge portions is folded back on itself, and this folded edge portion is then helically wound in lapping relationship to the unfolded edge portion and bonded to it to form a sealed helical lap seam having a thickness substantially equal to that of the unskived portions of the ply.

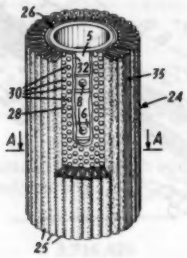
3,716,436
PROCESS FOR MAKING A BACK PRESSURE RESISTANT FILTER ELEMENT

David B. Pall, Roslyn Estates, and Tadas K. Jasaitis, Great Neck, both of N.Y., assignors to Pall Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 544,788, June 2, 1966, abandoned, and Ser. No. , , Division of Ser. No. 607,478, Jan. 5, 1967, Pat. No. 3,570,675. This application March 16, 1970, Ser. No. 24,455

Int. Cl. B01d 25/04; B32b 31/20

U.S. Cl. 156—218 9 Claims



A corrugated cylindrical filter element is disposed about a central core. A perforated plastic bonding sheet is disposed between the core and the filter. The bonding sheet is bonded in situ to the inner tips of the corrugations only.

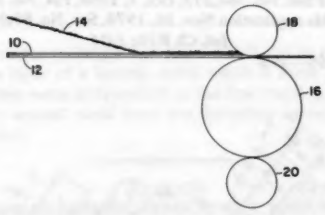
3,716,437
BASE FOR ADHESIVE TAPES

Nicholas S. Newman, 224 Chestnut Street, West Newton, Mass., and Donatas Satas, 99 Shenandoah Road, Warwick, R.I.

Division of Ser. No. 806,845, March 13, 1969, abandoned. This application Oct. 12, 1970, Ser. No. 33,134

Int. Cl. B32b 31/00

U.S. Cl. 156—244 4 Claims



A base film suitable for adhesive tapes of enhanced tensile strength combined with high dielectric strength is made by selecting an extruded composite film comprising a superimposed films of different softening points, and then reinforcing the loweresoftening film with an unwoven and unspun array of textile-length fibers.

3,716,438
GROMMET SEALING APPARATUS AND METHOD

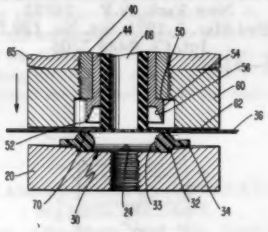
Henry H. Mackal, Fort Lauderdale, Fla., and George E. Lardner, Hawthorne, N.J., assignors to Halkey-Roberts Corporation, Paramus, N.J.

Filed Apr. 1, 1971, Ser. No. 130,170

Int. Cl. B32b 31/00

U.S. Cl. 156—253 18 Claims

Method of and apparatus for sealing annular members such as flanged plastic grommets to plastic sheet material. The apparatus includes opposing dies which are mounted on conventional electronic sealing machines. A flanged grommet is held in a first one of the dies, and a sheet of plastic material is superimposed upon such die and the grommet held thereby. The other, second die, which is mounted for reciprocation toward and away from the first die, carries a hole punch which, acting with the body of



the grommet, first punches a hole in the sheet material. The disc cut from the sheet is pushed out of the way by a yieldable member centrally carried by the second die. The sheet material is then electronically welded to the flange of the grommet, such flange preferably being simultaneously thinned and radially expanded.

3,716,439
METHOD OF MANUFACTURING CARDS

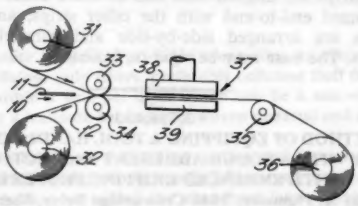
Sanetaka Maeda, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyota, Japan .

Filed Dec. 10, 1970, Ser. No. 96,888

Claims priority, application Japan, Dec. 15, 1969, 44/101105

Int. Cl. B32b 31/18; C09j 5/06; G09f 3/02

U.S. Cl. 156—269 1 Claim



A method of manufacturing credit cards and the like, wherein a card having necessary information visibly recorded therein is interposed between a pair of plastic films each having one surface coated with a layer of adhesive which is activated when heated, with the adhesive coated surface of each said film in contact with one surface of said card, and the card and films are passed between a pair of heated pressure rollers so as to form them into a unitary laminated construction.

3,716,440
METHOD OF MANUFACTURING A RESINOUS DECORATIVE LAMINATE HAVING A LUSTROUS PATTERN OF REALLY METALLIC SURFACE

Fumio Ando; Hideharu Kitahama, and Kazuhiro Sugiyama, all of Gifu-ken, Japan, assignors to Ilrigawa Electric Industry Co., Ltd., Gifu-ken, Japan

Filed Dec. 29, 1970, Ser. No. 102,533

Claims priority, application Japan, Jan. 19, 1970, 45/4430

Int. Cl. B32b 29/00, 31/20

U.S. Cl. 156—277 3 Claims

A novel resinous decorative laminate having a surface look of really metallic luster, such as that of gold or silver, is made

by hot-pressing an assembly of laminated materials which consists of a sheet of paper pattern impregnated therethrough with a thermosetting resin and having a pattern printed thereon by the use of a printing ink containing a metal powder and a resinous vehicle, and several basic layer materials impregnated with a thermosetting resin. There is no ordinary overlay paper used in forming the decorative laminate.

3,716,441

METHOD FOR PREPARING LAMINATED ARTICLE OF METALLIC, POLYMERIC AND WAX IMPREGNATED CELLULOSIC LAYERS

Ernest P. Black; Irl N. Duling, both of West Chester; John C. Merges, Jr., Glen Mills, and Alfred F. Talbot, Wallingford, all of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 6, 1970, Ser. No. 61,718
Int. Cl. C05j 7/04
U.S. Cl. 156—309 **9 Claims**

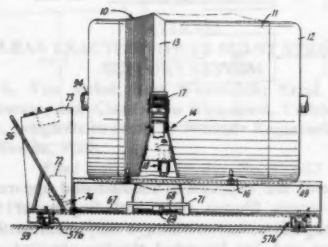
A tri-layer laminated article, having an outer wax impregnated cellulosic layer, a middle thermoplastic polymeric layer and an outer metallic layer, is easily prepared by applying a dispersion of solid polymer particles in molten wax to the surface of at least one of the outer layers and then placing the other outer layer adjacent to the dispersion. The application of heat and pressure to the resulting composite causes the cellulosic layer to be impregnated with wax and the polymer to form a molten middle layer. The latter upon cooling, solidifies resulting in the metallic layer firmly adhering to the solid polymeric layer which is firmly adhering to the wax impregnated cellulosic layer. The polymer used must be substantially insoluble in the molten wax at a temperature below the melting point of the polymer and have an adhesive capacity for both metallic and cellulosic materials. The resulting article has utility as a packaging material.

3,716,442

OFF-THE-ROAD TIRE BUILDING METHOD AND APPARATUS

Robert E. Hineline, Akron, Ohio, assignor to AMF Incorporated

Division of Ser. No. 656,283, July 26, 1967, Pat. No. 3,549,442. This application April 9, 1970, Ser. No. 31,445
Int. Cl. B29h 17/36
U.S. Cl. 156—397 **11 Claims**



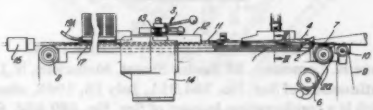
Apparatus for building tires, such as new off-the-road tires, on a drum arrangement whereby a strip of rubber is placed thereon as the drum continually rotates. The apparatus includes an application and sensing arm which guides the material onto the drum in a predetermined pattern in accordance with a straight line template. The application and sensing arm moves in a straight line across the surface of the building drum to build a tire contour in accordance with the template configuration. The apparatus is portable and may be removed from a building station when not required and thus used to serve a number of building stations.

3,716,443

CONTINUOUS ROD MAKING MACHINES

Edward George Preston, London, England, assignor to Molins Machine Company Limited, London, England

Filed Apr. 7, 1970, Ser. No. 26,298
Claims priority, application Great Britain, Apr. 10, 1969, 18,391/69
Int. Cl. B65h 17/32; D04h 3/00
U.S. Cl. 156—441 **16 Claims**



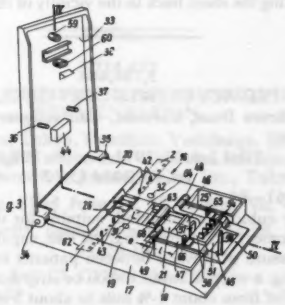
A continuous rod making machine, especially for making cigarette filter rods, has a heat exhanger after the heater to cool the adhesive. The heat exchanger uses air as a cooling medium and also to form an air bearing. There is also an air bearing between the garniture bed and tape.

3,716,444

APPARATUS FOR USE IN SPLICING TOGETHER THE ENDS OF TWO STRIPS

Rudolph Hanke, Monheim, Schwaben, Germany, assignor to Hamaphot Hama, K.G. Hanke & Thomas, Monheim, Schwaben, Germany

Filed Apr. 16, 1971, Ser. No. 134,638
Claims priority, application Germany, Sept. 3, 1970, P 20 43 674.2
Int. Cl. B31f 5/00; G03d 15/04
U.S. Cl. 156—505 **11 Claims**



Apparatus for splicing together the ends of two strips arranged end-to-end by means of an adhesive tab comprises a base whereon are provided holding means for holding the strips overlapped and in register with a cutting device mounted on a carriage sildable in the base, a swingable applicator for receiving the adhesive tab whilst its adhesive is protected by peelable backing strips, peeling it from the backing strips and applying half of said tab

to one side of the adjacent ends of the two strips, and a mechanism for engaging the other half of the tab to fold it against the other side of said ends of the two strips, a lid being provided on the base; the arrangement is such that splicing is effected by positioning the backing strips of the tab, on retainer pegs, for engagement of the tab by the applicator, and locating the strips on the holding means, closing the lid to cause severance of said strips at their overlap and firm engagement of said backing strips with retainer pegs and to release said carriage for movement to an intermediate position upon opening of said lid, in which intermediate position said cutting device is withdrawn and a flat counter surface is in register with the strips to be joined, swinging said applicator from its tab-receiving position to a tab-applying position thereby to peel said tab from said backing strips and applying said half to said strips to be joined and also to initiate further movement of said carriage to operate said mechanism for engaging the other half of said tab to fold it against said other side of said two strips.

3,716,445

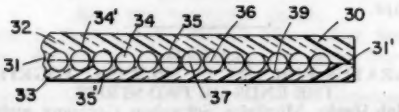
REFLEX REFLECTIVE SHEETING

Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.

Continuation of Ser. No. 744,911, July 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 489,654, Sept. 23, 1965, Pat. No. 3,396,637, which is a continuation-in-part of Ser. No. 360,954, June 11, 1953, Pat. No. 3,220,871. This application June 24, 1970, Ser. No. 56,047

Int. Cl. B44f *1/02*

U.S. Cl. 161—2 **4 Claims**



New and improved structures in reflective sheeting are provided which may be produced automatically and continuously of a single material in substantially long lengths and areas larger than heretofore possible. In one form, the material of which the reflective sheeting is made comprises a flexible transparent polymer which has one or more surfaces of which sheeting has been embossed in a manner to reflect incident light striking the sheet back to the vicinity of the source.

3,716,446

PRIVACY CUBICLE CURTAIN CLOTH

William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson

Filed Jan. 21, 1971, Ser. No. 108,634

Int. Cl. D03d *15/12*

U.S. Cl. 161—91 **4 Claims**

Privacy cubicle curtain cloth suitable for use in hospitals, nursing homes, sanitariums, and the like, capable of providing some measure of privacy between patients in adjacent beds comprising: a warp of saran ribbon or strip materials having a thickness of from about 1-½ mils to about 3 mils and a width of from about 20 mils to about 35 mils; and a frilling of polypropylene spun yarn having a yarn size of from about 8/1 to about 12/1, as calculated on the cotton count system, said privacy cubicle cloth being inherently fire retardant or flame resistant and self-extinguishing, relatively inert chemically in the presence of gases and liquids normally found in hospitals, commercially launderable, and having sufficiently light weight characteristics as to be easily handled and quickly drawn or pulled back in use, while still being opaque or translucent but not transparent to afford some measure of privacy to patients.

3,716,447

DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP WITH OXYGEN AND ALKALI IN THE PRESENCE OF MAGNESIUM CHLORIDE INHIBITOR

Tin Aung, and William M. Boyle, Jr., both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1969, Ser. No. 885,375

Int. Cl. D21c *9/12*

U.S. Cl. 162—65 **3 Claims**

Delignification and bleaching of cellulose pulp with oxygen and alkali by blending the cellulose pulp with an inhibiting quantity of magnesium chloride and then with alkali prior to heating with oxygen. The mixture of magnesium chloride and alkali precipitate finely divided and well dispersed magnesium hydroxide in situ within the cellulose pulp stabilizing the cellulose during the delignification process.

3,716,448

SINGLE STAGE DELIGNIFICATION AND BLEACHING OF CHEMICAL PULP WITH OXYGEN IN THE PRESENCE OF A PROTECTOR

Sunanda K. Roymoulik, Suffern, N.Y., assignor to International Paper Company, New York, N.Y.

Filed May 25, 1970, Ser. No. 40,429

Int. Cl. D21c *9/10*

U.S. Cl. 162—65 **8 Claims**

Delignification and bleaching of chemical pulp is achieved by treating the pulp in a single stage with oxygen at elevated temperature and pressure in the presence of a protector selected from the group consisting of $Na_2S_2O_4$ and Na_2S_x, where x is an integer from 1 to 4.

3,716,449

METHOD AND APPARATUS FOR FORMING A NON-WOVEN FIBROUS WEB FROM A FOAMED FIBER FURNISH

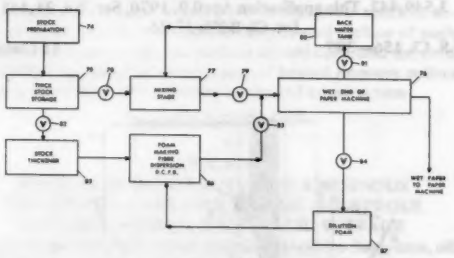
Albert Peter John Gatward, Beaconsfield, and Bronislaw Radvan, Flackwell Heath, both of England, assignors to Wiggins Teape Research & Development Limited, London, England

Continuation-in-part of Ser. No. 854,246, Aug. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 640,411, May 22, 1967, abandoned. This application Nov. 19, 1970, Ser. No. 91,104

Claims priority, application Great Britain, March 31, 1966, 24125/66

Int. Cl. D21d *3/00, 5/28*

U.S. Cl. 162—101 **22 Claims**



Improvements are afforded in method and apparatus for making non-woven fibrous webs including paper from a foamed aqueous furnish containing a surfactant in that the foam acquires and has imparted thereto physical characteristics as regards attainment of such a highly emulsified state that the bubbles are scarcely visible to the naked eye, as regards viscosity build-up of the foam to at least 22 seconds as

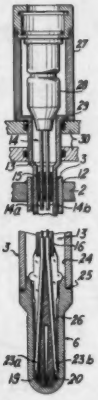
measured with a Ford Cup Type B-4 and as regards the specific gravity being no greater than 0.35. Other improvements pertain to vortical mixing in the production of the foam, to combining the method and apparatus with conventional methods and apparatus and to handling the surfactant-containing water when in the foamed furnish and likewise as drained from the formed web.

3,716,450

DEVICE FOR REMOTE POSITIONING OF THERMOCOUPLES IN A NUCLEAR REACTOR

Noël Lions, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 15, 1969, Ser. No. 857,791
Int. Cl. G21c *17/00*
U.S. Cl. 176—19 R **5 Claims**



Remote positioning of thermocouples in proximity to the fuel assemblies of a nuclear reactor core is carried out by means of a device comprising an elongated cylindrical guide tube secured at one open extremity to the seal plug of the reactor vessel whilst the other extremity is closed by an end-piece which is mounted in proximity to the fuel assemblies and which has a smaller internal cross-sectional area than the guide tube. The device essentially comprises a flexible metallic positioning arm which is capable of sliding within the interior of the guide tube and at least one thermocouple cable mounted inside the positioning arm. That end of the cable which carries the sensitive element of the thermocouple is attached to the exterior of an elastic clamp which is secured to the positioning arm. The open end of the positioning arm is engaged within the guide tube until it penetrates in the end-piece, thereby closing the clamp and bringing the sensitive element into contact with the surface of the end-piece.

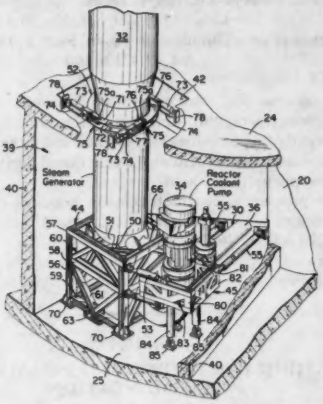
3,716,451

NUCLEAR REACTOR POWER PLANT STRUCTURAL SUPPORT SYSTEM

Alfred L. Van Sickel, East Weymouth; Errol S. Mitchell, Dorchester, and Gianfranco Rigamonti, Cambridge, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Nov. 30, 1970, Ser. No. 93,687
Int. Cl. G21c *15/22, 21/00*
U.S. Cl. 176—65 **10 Claims**

A structural support system for the steam generators and reactor coolant circulating pumps of a nuclear power plant in which each steam generator is carried in a lower frame support mounted on linear slides and also is supported by an upper ring to which there is secured four equi-spaced hydraulic snubber assemblies mounted to the charging floor of the power plant at perpendicular directions to each other. Each reactor coolant pump is carried in a pivotally mounted frame



support adjacent its associated steam generator. Hydraulic snubber assemblies extend between each steam generator and its associated reactor coolant pump and also between the reactor shield wall and each of the steam generators and reactor coolant pumps.

3,716,452

LYSIS OF YEAST CELL WALLS

Kunpei Kitamura; Tatsuhiko Kaneko; Yasushi Yamamoto, and Yoshiro Kuroiwa, all of Takasaki-shi, Japan, assignors to Kirin Beer Kabushiki Kaisha, a.k.a., Kirin Brewery Co., Ltd., Tokyo, Japan

Filed Sept. 17, 1970, Ser. No. 73,061
Int. Cl. C12d *13/10*; A23j *1/18*
U.S. Cl. 195—2 **16 Claims**

An enzyme which is capable of lysing yeast cell walls is produced by microorganisms belonging to Arthrobacter luteus nov. sp. The enzyme has a unique activity for lysing cell walls of yeast dead or alive and in any stage of growth.

3,716,453

METHOD OF PRODUCING L-HISTIDINE BY FERMENTATION

Shinji Okumura, Tokyo, Fumihiro Yoshinaga, Kanagawaken, and Koji Kubota and Hirotaka Kamijo, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed June 10, 1970, Ser. No. 45,262
Claims priority, application Japan, June 25, 1969, 44/50,161
Int. Cl. C12b *1/00*; C12d
U.S. Cl. 195—29 **9 Claims**

Microorganisms of the genera Brevibacterium, Corynebacterium, and Arthrobacter are exposed to mutagenic chemical agents or to ionizing radiation, and the exposed organisms are screened for the presence of mutants capable of producing L-histidine by aerobic fermentation of conventional culture media. The best mutant strain so selected produces 4.3 g./l. L-histidine in the broth within 48 hours. The histidine is recovered in good yields by absorption from the broth on ion exchange resin.

3,716,454
PROCESS FOR THE PRODUCTION OF α-AMINOBENZLPENICILLIN

Noriaki Kuwana, Nerima-ku, Tokyo; Tamio Kawamura, Bunkyo-ku, Yokyo, and Masayuki Fukumura, Hiratsuka-shi, Kanagawa, all of Japan, assignors to Eisai Kabushiki Kaisha, Bunkyo-Ku, Tokyo, Japan

Filed May 11, 1970, Ser. No. 36,482
Claims priority, application Japan, Sept. 2, 1969, 44/69075
Int. Cl. C12d *9/00*
U.S. Cl. 195—30 8 Claims

A process for the enzymatic production of D-(-)-α-aminobenzylpenicillin, i.e., Ampicillin, which is one of the semi-synthetic penicillins useful as an antibiotic, starting from 6-aminopenicillanic acid and a functional derivative of D-(-)-α-aminophenylacetic acid.

The process is conducted in an aqueous medium in the presence of a new microorganism named Flavobacterium EF 44–102 (ATCC No. 21429).

The said microorganism efficiently catalyzes the afore-mentioned enzymatic reaction to form ampicillin.

3,716,455
METHOD FOR PRODUCING ISOAMYLASE BY FERMENTATION

Seinosuke Ueda, Fukuoka-shi, Nobuya Nanri, Fukuoka-ken, and Motoyoshi Hongo, Fukuoka-shi, Japan, assignors to Hayashibara Co., Ltd., Okayama-shi, Japan

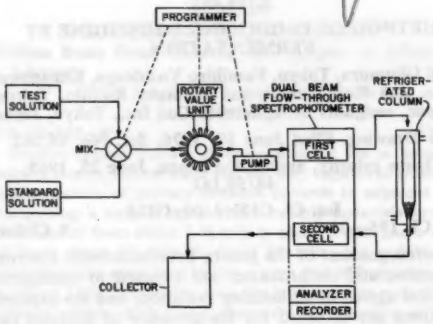
No Drawing. Continuation of application Ser. No. 667,345, Sept. 13, 1967. This application Aug. 1, 1968, Ser. No. 749,288
Claims priority, application Japan, Sept. 22, 1966, 41/62,328
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 1 Claim

Production of isoamylase by fermentation of a microorganism belonging to *Escherichia intermedia* in a culturing medium at 20°–40° C. and at pH 6–9. The isoamylase is an enzyme which decomposes the α-1,-6-linkage of starch.

3,716,456
ANION MONITORING SYSTEM

Howard H. Weetall, Elmira, N.Y., assignor to Corning Glass Works

Filed May 14, 1971, Ser. No. 143,502
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R 25 Claims

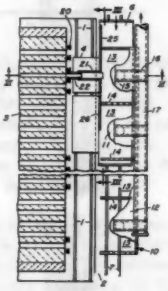


Continuous-flow monitoring system for determining the concentration of anions in an aqueous solution. The system is based on the inhibition by the anion of the enzymatic hydrolysis of an ester of the anion. Specific methods for determining the concentrations of inorganic phosphate and sulfate are disclosed.

3,716,457
APPARATUS FOR PREVENTING AIR POLLUTION DURING COKE OVEN DISCHARGE

Erich F. Schon, Bochum - Weitmar, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochuma, Germany

Filed Oct. 22, 1970, Ser. No. 83,111
Int. Cl. C10b *33/00*
U.S. Cl. 202—263 8 Claims



A tubular coke guide, supported by a carriage in front of a row of coke ovens, receives coke from each oven in succession and discharges it into a quencher car. This car is covered by a stationary housing extending throughout the length of the row of ovens. The housing has a roof and an outer wall extending therefrom down close to the outer side of the quencher car. The bottom and inner side of the housing are open and the inside of the housing is divided into cells by means of transverse upright partitions. The upper part of each cell is provided with a valved outlet connected to a suction line. Upright closure walls supported by the carriage extend from the outer end of the coke guide in opposite directions along the housing far enough to close the side of the cell beside them. The tops of these walls substantially engage the housing roof, and their bottoms are close to the inner side of the car. The cell into which the coke is being discharged therefore will have four side walls and a roof so that the smoke and dust produced in the cell will be drawn out through its outlet by means of the suction line.

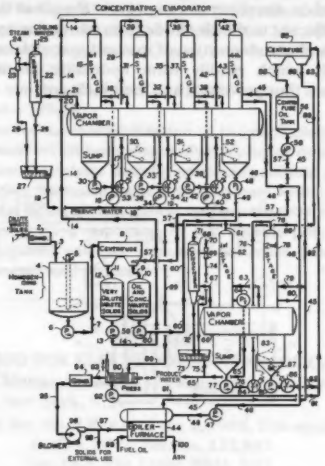
3,716,458
PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER FROM DILUTE SOLUTIONS OF WASTE SOLIDS

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Carver-Greenfield Corporation, Hanover, N.J.

Filed Sept. 18, 1970, Ser. No. 73,336
Int. Cl. B01d *3/00, 3/08, 3/02, 1/00*; B01b *; A23c 5/00*
U.S. Cl. 203—11 13 Claims

An improved process and apparatus for recovering clean water from dilute solutions of waste solids. A dilute stream of

waste solids is concentrated by evaporation and the evaporated water is condensed and recovered. The waste solids in concentrated solution are mixed with oil and subject



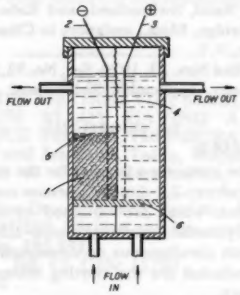
to further drying by evaporation. Again the evaporated water is condensed and recovered. If desired, the waste solids may be separated from the oil which may then be recycled.

3,716,459

ELECTROCHEMICAL PROCESSES

David Stanley Salter, Horsham, and David Henry Smith, Guildford, England, assignors to Constructors John Brown Limited, London, England

Filed Oct. 16, 1969, Ser. No. 866,956
Int. Cl. B01k 3/00
U.S. Cl. 204—1 R 11 Claims



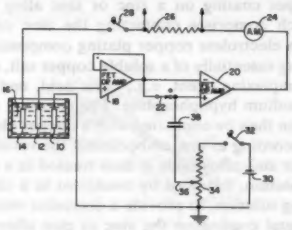
Electrochemical processes wherein at least one of the electrodes at which electron transfer occurs comprises a mass of discrete particles of particle size up to 2000μ which particles are comprised of a material selected from the group consisting of electrically conductive and partially electrically conductive materials, the mass of particles being supported on a fluid-permeable support and wherein a fluid is caused to flow upwards through the mass of particles in such a manner as to impart movement to the particles, the degree of upward movement of the particles in the fluid stream being limited by a particle-impermeable barrier positioned above the particle bed so that the volume occupied by the particles is less than the volume which the particles would occupy as a fluidised bed.

3,716,460

METHOD FOR DETERMINING CORROSION RATE AND METER THEREFOR

Aaron Weisstuch, Philadelphia, Charles E. Schell III, Levittown, and Paul C. Dryden, Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 21, 1971, Ser. No. 154,770
Int. Cl. G01n 27/26
U.S. Cl. 204—1 T 13 Claims



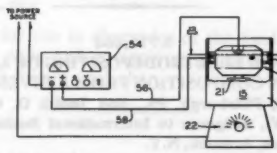
A three electrode corrosion rate meter including a potentiostat for providing a corrosion rate current wherein a capacitor is used to measure, store and program to the potentiostat the potential difference between the test and reference electrodes.

3,716,461

PROCESS FOR FORMING COMPOSITE MATERIAL BY ELECTRODEPOSITION UNDER THE INFLUENCE OF A CENTRIFUGAL FORCE FIELD

Iqbal Ahmad, Elnora, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed May 13, 1969, Ser. No. 824,129
Int. Cl. C23b 5/48, 7/02, 5/68
U.S. Cl. 204—16 9 Claims

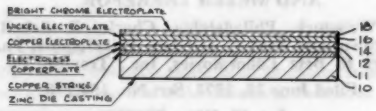


An improvement in the techniques of forming composite material by electrodeposition whereby the electrolyte slurry containing the reinforcing whiskers or fibers is subjected to a centrifugal force field to press the whiskers or fibers against the cathode and form a permeable mat thereagainst for encapsulation by the deposited matrix metal. Thus, the percent by volume of the whiskers or fibers in the deposited composite material can be increased substantially above that which is possible by conventional electrodeposition technique.

3,716,462
COPPER PLATING ON ZINC AND ITS ALLOYS

Darwin P. Jensen, 2565 Palos Verdes West, Palos Verdes Estates, Calif.

Filed Oct. 5, 1970, Ser. No. 77,828
Int. Cl. C23f *17/00*; C23b *5/20*; C23c *3/02*
U.S. Cl. 204—38 B 17 Claims



Production of a uniform, continuous corrosion resistant bonded copper coating on a zinc or zinc alloy body, by a process which comprises contacting the zinc or zinc alloy body with an electroless copper plating composition or solution consisting essentially of a soluble copper salt, e.g., copper sulfate, a complexing agent, e.g., citric acid, and a reducing agent, e.g., sodium hypophosphite. The resulting zinc or zinc alloy body can then be contacted with a copper electroplating bath, and according to one embodiment the resulting copper plated zinc or zinc alloy body is then treated in a nickel electroplating solution, followed by treatment in a chromic acid electroplating solution, to provide a corrosion resistant bright attractive metal coating on the zinc or zinc alloy body. The above noted novel electroless copper plating composition, and the zinc or zinc alloy article coated with an electroless copper plating.

3,716,463
BRIGHT GOLD ALLOY ELECTROPLATING BATH AND PROCESS

Maurice Bick, South Orange, and Jean A. Lochet, Fords, N.J., assignors to Auric Corporation, Newark, N.J.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,334
Int. Cl. G01n *5/42, 5/46*
U.S. Cl. 204—43 10 Claims

An electroplating bath for effecting bright and relatively stress-free deposits of gold alloys. The bath is an aqueous solution of a soluble gold-alkali metal cyanide and a weak, stable, partially neutralized organic acid, together with quantities of cyclohexylamine and small amounts of soluble base metal salts or complexes to provide the desired alloy. A buffering agent for stabilizing the pH of the bath may also be incorporated into the bath.

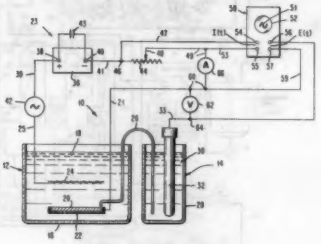
3,716,464
METHOD FOR ELECTRODEPOSITING OF ALLOY FILM OF A GIVEN COMPOSITION FROM A GIVEN SOLUTION

Zlata Kovac, Pittsburgh, Pa., and Judith D. Olsen, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,106
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 8 Claims

The effect of superimposing a sinusoidal alternating current on a direct current during electrodeposition of Ni—Fe alloys is disclosed in terms of the following factors: (a) maintaining the pH at the electrode equal to that of the bulk electrolyte; (b) ionic diffusion processes; and (c) chemical processes in solution prior to electrochemical reduction. The effect of frequency, amplitude and the rate of a-c current to d-c current on the composition of electrodeposited alloy are given for acid solutions of different pH and for alkaline solutions of metallic complexes with a variable concentration of complexing agent. It is shown that by proper choice of conditions, electrodeposited Fe—Ni alloys can be prepared with a desired uniform composition throughout their thickness.

In the practice of this disclosure, alternating current is superimposed on direct current to prevent the pH in the layer of solution adjacent to the electrode from increasing and thus influence the electrodeposition of iron group metals or alloys of any metals which readily form hydroxide. Formation of hydroxides is thus prevented and their inclusion into deposited



film is precluded. Additionally, the a-c current beneficially affects the rate of deposition of a metal which is controlled by diffusion. There is no concentration gradient of composition across the thickness of a film of Ni-Fe deposited by practice of this disclosure. Illustratively, Ni and Fe plate out at the same rate for thickness of film approximately in the range of 300A. to 4,000A. By control of the density of the d-c current, and the amplitude and frequency of the a-c current, Ni-Fe film of any given composition approximately in the range of 6 to 60 percent Fe is electroplated from the same solution.

3,716,465
PROCESS FOR THE MANUFACTURE OF THIAZACYCLIC HYDROXY COMPOUNDS

Karl Heusler, Basel, Switzerland, and Robert Burns Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,203
Claims priority, application Switzerland, Nov. 27, 1969, 17669/69
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 R 11 Claims

The invention concerns a process for the manufacture of 6-acylamino-3-hydroxy-2,2-dimethyl-penam compounds, useful as intermediates, which are obtained by irradiation of 6-acylamino-3-arylmethoxycarbonyl-amino-2,2-dimethylpenam compounds with simultaneous or subsequent treatment with water. Also included are the starting materials used in the above procedure.

3,716,466
THIOESTER CROSS-LINKING AGENTS

Edwin O. Hook, Marshfield, Mass., assignor to Moleculon Research Corporation, Cambridge, Mass.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,366
Int. Cl. C08f *1/24, 27/06*
U.S. Cl. 204—159.17 12 Claims

New thioester cross-linking monomers and methods of increasing cross-linking and oxidation resistance through their addition to various polymeric materials.

3,716,467

PROCESS FOR THE RADIATION INSOLUBILIZATION OF N-(VINYL) PHENYLACRYLAMIDE

Hiroyoshi Kamogawa, Kawasaki, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 838,662, July 2, 1969, abandoned. This application March 15, 1972, Ser. No. 234,985
Claims priority, application Japan, July 5, 1968, 43/46865; July 5, 1968, 43/46866
Int. Cl. C08d *1/10*; C08f *1/16*
U.S. Cl. 204—159.18 7 Claims

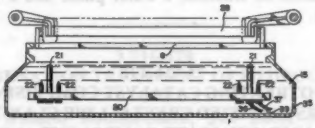
A process for the insolubilization of N-(vinyl)phenylacrylamide polymers which comprises polymerizing or copolymerizing by cationic catalysts thereby producing soluble polymers, and irradiating the resulting soluble polymers with light in the presence of a light polymerization initiator thereby polymerizing the vinyl groups remaining in said soluble polymers and three-dimentional network structure polymers produced by the above mentioned process.

3,716,468

METHOD FOR ELECTRODEPOSITION OF CANS

Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Co., Inc., New York, N.Y.

Division of Ser. No. 829,411, June 2, 1969. This application April 9, 1971, Ser. No. 132,857
Int. Cl. C23b *13/00*; B01k *5/02*
U.S. Cl. 204—181 10 Claims



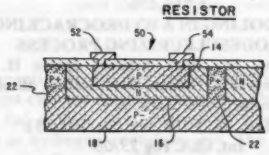
A method of depositing a coating onto a can body by electrolysis in which the can bodies are forced down between spaced electrodes and a current is sent between the spaced electrodes and another electrode located at a distance from the spaced electrodes. Electric potential is applied across from the can body to the other electrode and depositing of a coating takes place.

3,716,469

FABRICATION METHOD FOR MAKING AN ALUMINUM ALLOY HAVING A HIGH RESISTANCE TO ELECTROMIGRATION

Harshad J. Bhatt and James W. Tuttle, Wappingers Falls, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Original application Dec. 17, 1970, Ser. No. 99,036, now Patent No. 3,631,305. Divided and this application Oct. 1, 1971, Ser. No. 185,591
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 14 Claims



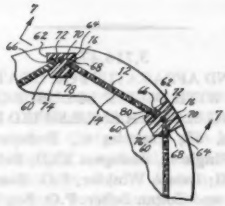
This disclosure is directed to an improved semiconductor device, electrical conductor, thin film conductor, alloy and fabrication methods therefor. An aluminum-oxide-copper alloy conductor is disclosed which has a high resistance to electromigration and hence, a conductor lifetime greater by at least a factor of 10 than unalloyed aluminum conductors. Semiconductor devices utilizing this aluminum alloy in the thin film conductive stripes interconnecting different conductivity regions or devices located in the semiconductor substrate are significantly improved and more reliable.

3,716,470

ELECTROPLATING BARREL CONSTRUCTED FROM TWO DISPARATE PLASTICS

Walter F. Noonan, Wallingford, Pa., assignor to Westlake Plastics Co., Lenni, Pa.

Filed June 8, 1971, Ser. No. 150,985
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 12 Claims



A polyhedral rotatable electroplating barrel in which the axial ribs or struts and end heads are made of a thermoplastic resin whose deflection temperature as well as tensile and flexural strengths exceeds those of the thermoplastic resin used for the perforate panels with means interconnecting the ribs, heads and panels so that the panels are free to expand without buckling in all three dimensions into grooves in the ribs and heads.

3,716,471

ELECTRODE OF PETROLEUM COKE AND BROWN COAL CHAR

Geoffrey Victor Cullen, North Balwyn, John William Graham, Essendon, and Neil Graham Siviour, East Kew, Victoria, Australia, assignors to University of Melbourne, Victoria, Australia

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,874
Int. Cl. B01r *3/08*
U.S. Cl. 204—294 4 Claims

A material for use in electrodes of the kind employed in electrolytic cells and comprising a mixture of petroleum coke and brown coal char.

3,716,472

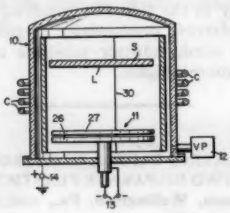
CATHODE ATOMIZATION APPARATUS

Helmold Kausche, Munich-Pasing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 614,156, Feb. 6, 1967, abandoned. This application May 20, 1970, Ser. No. 39,121
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 5 Claims

A cathode structure for use in a cathode sputtering apparatus for production of a homogeneous multi-component layer on a substrate. For example, the multi-component layer is a magneto striction free ferromagnetic Ni-Fe layer. The

cathode is composed of individual components of the multi-component layer and each of the individual component surfaces is selectively varied to control the amount of that component sputtered during formation of the multi-component layer.



3,716,473

METHOD AND APPARATUS FOR COATING METAL WORKPIECES WITH WATER SOLUBLE OR COLLOIDAL COLORING MATTER EMULSIFIED IN WATER

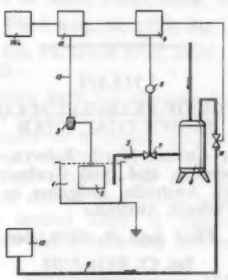
Jozsef Domokos, 67, Tancsics u., Budapest XIX; Gyorgy Benedek, 35 Ringlo u., Budapest XXII; Bela Kiss, 8, Mecset u., Budapest II; Laszlo Winkler, P.O. Box 36, Nap u., Budapest XVIII, and Zoltan Beller, P.O. Box 78/a, Nemetvologyi u., Budapest XII, all of Hungary

Division of Ser. No. 698,273, Jan. 16, 1968. This application June 21, 1971, Ser. No. 155,199

Claims priority, application Hungary, Jan. 20, 1967, DO-310

Int. Cl. B01k *5/02;* **C23b** *13/00*

U.S. Cl. 204—299 **2 Claims**



A method and apparatus for coating metal workpieces with coloring matter. The metal workpieces which are continuously coated, one after the other, are connected into an electrical circuit to form an anode thereof, and they are advanced sequentially through a solution which has either water soluble coloring matter or colloidal coloring matter emulsified in water. This solution is contained in a vessel which forms a cathode of the electrical circuit, and a coulometer-integrator-regulating means coacts with an anode bar which is connected to the workpiece for sensing a time impulse and a current-amount impulse. A supply means is provided for supplying the solution of coloring matter to the vessel, and a valve means coacts with this supply means for controlling the flow of coloring matter therefrom to the vessel, this valve means being actuated by an actuating means which is operatively connected with the coulometer-integrator-regulating means to be regulated thereby for maintaining constant the concentration of coloring matter in the solution in the cathode-forming vessel.

3,716,474

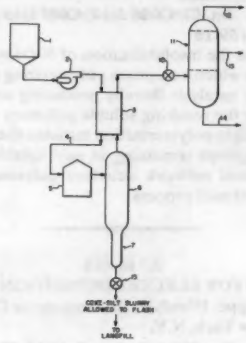
HIGH PRESSURE THERMAL TREATMENT OF WASTE OIL-CONTAINING SLUDGES

Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 83,057

Int. Cl. B01d *17/04;* **C02b** *1/02*

U.S. Cl. 208—13 **7 Claims**



Oil-water emulsion-type sludges, in particular refinery pit sludges are thermally treated at a temperature of at least 750° F under pressure of at least 3,000 psi to give a gas phase containing saturated hydrocarbons, suitable as fuel or cracking stock, a usable oil fraction, a water phase and a useful silt-coke phase.

3,716,475

HYDROTREATING CATALYST COMPRISING AN INTERSTRATIFIED CRYSTALLINE CLAY-TYPE ALUMINOSILICATE COMPONENT AND A CRYSTALLINE ZEOLITIC MOLECULAR SIEVE COMPONENT AND PROCESS USING SAID CATALYST

Sigmund M. Csicsery, Lafayette, and James R. Kittrell, Palos Verdes Estates, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 30, 1970, Ser. No. 7,179

Int. Cl. C10g *13/04;* **C01b** *33/28;* **B01j** *11/40*

U.S. Cl. 208—59 **20 Claims**

A catalyst comprising an interstratified synthetic crystalline aluminosilicate cracking component and a crystalline zeolitic molecular sieve component, which may be dispersed in a matrix comprising a siliceous gel, if desired one or both of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when dispersed in a matrix, and if desired one of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when not dispersed in a matrix, a hydrogenating component selected from platinum and compounds thereof and palladium and compounds thereof, a component selected from the metals cerium, manganese, zinc, and compounds of said metals, and processes using said catalyst.

3,716,476

EFFLUENT COOLING IN A HYDROCRACKING AND HYDRODESULFURIZING PROCESS

William R. Coons, Jr., Port Arthur; James H. Colvert, Houston, and Gerald V. Nelson, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 102,251

Int. Cl. C10g *23/00*

U.S. Cl. 208—97 **6 Claims**

A residue-containing petroleum fraction, 50 percent boiling above 1,000°F, is hydrocracked and then hydrodesulfurized. During the onstream period, the conversion level of material boiling above 1,000°F is maintained substantially constant

while the sulfur content of the hydrocracked effluent increases. The sulphur content of a product fraction is maintained substantially constant by gradually increasing the hydrodesulfurization temperature. The effluent from the hydrocracking reaction is cooled by adding an aromatic-rich fraction and the cooled mixture is passed to the desulfurization reaction.

3,716,477

LOW PRESSURE REGENERATIVE REFORMING PROCESS

Robert L. Jacobson, Penole, and Robert D. Vanselow, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 64,067, July 24, 1970, abandoned, which is a continuation of Ser. No. 740,566, June 27, 1968, abandoned. This application Oct. 6, 1970, Ser. No. 80,885The portion of the term of this patent subsequent to Jan. 26, 1988, has been disclaimed.

Int. Cl. C10g *35/08*

U.S. Cl. 208—139 **10 Claims**

A naphtha feed is reformed to high octane gasoline products at a pressure from 20 to 100 psig, a hydrogen or hydrocarbon mole ratio of less than 2 and a liquid hourly space velocity of 0.5 to 5, using a catalyst comprising platinum and rhenium supported on a porous inorganic oxide carrier. The reforming process is periodically discontinued to permit regeneration of the catalyst to restore substantially its initial activity.

3,716,478

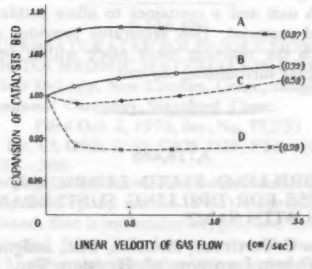
HYDROGENATION TREATMENT OF HYDROCARBON OIL

Yoshihide Kodera, Kanagawaken; Jun Kato, Meguro-ku, Tokyo; Kazuo Shimada, Kitaku, Tokyo; Morio Suzuki, Tsujido, Fujisawa-shi, Kanagawa-ken; Hidetaka Ohse, Soka-shi, Saitama-ken; Satoshi Ohshima, and Yasunori Kiriki, both of Meguro-ku, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 10, 1970, Ser. No. 10,146

Int. Cl. C10g *23/10*

U.S. Cl. 208—152 **2 Claims**



Hydrogenation treatments of hydrocarbon oil is carried out in a catalyst-charged reaction vessel into the lower portion of which is fed a flow of a mixture of hydrocarbon oil and hydrogen or hydrogen-containing gas. The supply velocity of the mixture is adjusted so that catalyst particles in the catalyst layer do not fluidize. At the lower portion of the reaction vessel is provided an appropriate catalyst-withdrawing means by which deactivated catalyst particles are withdrawn during reaction.

3,716,479

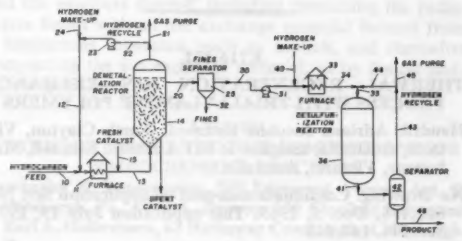
DEMETALATION OF HYDROCARBON CHARGE STOCKS

Paul B. Weisz, Yardley, and Anthony J. Silvestri, Morrisville, both of Pa., assignors to Mobil Oil Corporation

Filed Dec. 23, 1970, Ser. No. 100,931

Int. Cl. C10g *23/02*

U.S. Cl. 208—211 **23 Claims**



This specification discloses the demetalation of a hydrocarbon charge stock. The demetalation procedure involves contacting the hydrocarbon charge stock with hydrogen in the presence of, as a catalyst, a material derived from the naturally-occurring underwater deposit known as a manganese nodule. The manganese nodule may be employed without pretreatment or may be pretreated by sulfiding or by leaching to remove and recover one or more valuable metallic constituents. The manganese nodule catalyst, after it has become deactivated by use, may be processed to remove and recover one or more valuable metallic constituents.

3,716,480

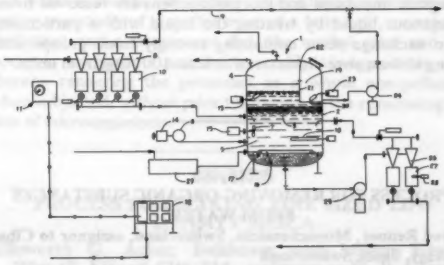
METHOD AND APPARATUS FOR CLEANING SOLIDS COATED WITH OIL

Bruce M. Finley and Paul G. Sturdivan, Oklahoma City, Okla., assignors to Demco Incorporated, Oklahoma City, Okla.

Filed June 21, 1971, Ser. No. 154,803

Int. Cl. B01d *17/02*

U.S. Cl. 210—22 **15 Claims**



A method and apparatus for cleaning solids coated with oil and removing oil therefrom is disclosed and includes a solids clarifier tank having a selected liquid therein and for receiving a portion of oil well production comprising a mixture of oil and solids coated with oil and having a baffle positioned therein to divide the clarifier tank into upper and lower chambers and a pump operative to in-

ject a surfactant into the mixture of oil and solids coated with oil and the selected liquid which is mixed by agitation or mixing blades to disburse the surfactant throughout the mixture to effect rising of the oil which is removed from the upper chamber and settling of the solids which are removed from a lower portion of the lower chamber as a solids-liquid slurry which is separated into a solids portion to be discharged for disposal and a liquid portion which is returned to the clarifier tank.

3,716,481

THERMAL REGENERATION ION EXCHANGE PROCESS WITH TRIALLYLAMINE POLYMERS

Hendrik Adriaan Jacobus Battaerd, North Clayton, Victoria, Australia, assignor to ICI Australia Limited, Melbourne, Victoria, Australia

No Drawing. Continuation-in-part of application Ser. No. 882,496, Dec. 5, 1969. This application July 19, 1971, Ser. No. 164,148

Int. Cl. B01j *1/08;* **C02b** *1/16*

U.S. Cl. 210—32 **3 Claims**

Process for the demineralization of water by a mixed bed of weak acid and weak base type ion exchange resins in which the mixed bed is regenerated by eluting it with water or a saline solution at a temperature exceeding that employed during the adsorption stage. The process utilizes as the weak base resin at least one solid polymer comprising between 3 and 100 mole percent of triallylamine and a balance of at least one allylamine comer. The polymer used is prepared by exposing the allylic monomer or monomers to a total dose of from 3 to 20 megarads of high energy radiation at a temperature between −80° C. and +120° C.

3,716,482

ANION EXCHANGER WITH SPONGE STRUCTURE AND PROCESS OF USING SAME

Herbert Corte, Leverkusen, and Alfred Meyer, Cologne-Stammheim, both of Germany, assignors to Bayer Aktiengesellschaft

Division of Ser. No. 718,989, March 4, 1958, Pat. No. 3,637,535. This application Sept. 14, 1970, Ser. No. 72,198

Claims priority, application Germany, March 9, 1957, 2253239

Int. Cl. C02c *1/60*

U.S. Cl. 210—37 **8 Claims**

Organic impurities and inorganic anions are removed from an aqueous liquid by treating the liquid with a particulate anion exchange resin containing strongly basic groups and having a mean pore diameter of at least 100 Angstrom units.

3,716,483

PROCESS FOR REMOVING ORGANIC SUBSTANCES FROM WATER

Alfred Renner, Muenchenstein, Switzerland, assignor to Ciba-Geigy, Basel, Switzerland

Filed July 21, 1970, Ser. No. 56,955

Claims priority, application Switzerland, Aug. 1, 1969, 11754/69

Int. Cl. E02b *15/04*

U.S. Cl. 210—40 **3 Claims**

Process for removing dissolved, emulsified or suspended organic substances, for example fat, resin, oil or dyestuff, from water in which the contaminated water is brought into contact with a highly disperse, solid, water-insoluble organic polymer, for example melamine-formaldehyde resin or polyacrylonitrile of average molecular weight greater than 1,000 and a specific surface area greater than 5 m^2/g, and the polymer charged with the contamination is separated from the water.

3,716,484

PROCESS FOR SUBSTANTIAL REMOVAL OF PHOSPHATES FROM WASTEWATERS

Patrick A. Lincoln, St. Louis, and Philip G. Delamater, Alma, both of Mich., assignors to Michigan Chemical Corporation, St. Louis, Mich.

Filed May 10, 1971, Ser. No. 142,032

Int. Cl. C02c *1/40*

U.S. Cl. 210—52 **3 Claims**

The invention is directed to a process for removing substantial amounts of soluble phosphates from wastewaters at primary treatment stages by means of chemical precipitation utilizing calcium chloride at a pH of 8–9.5, or a combination of calcium chloride and calcium hydroxide. An equivalent amount of calcia may be used in place of the calcium hydroxide.

3,716,485

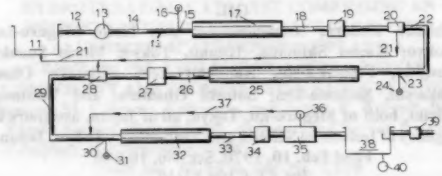
PROCESS AND APPARATUS FOR DESTROYING HEXAVALENT CHROMIUM IN SOLUTION

Richard G. Robertson, Parma Heights, Ohio, assignor to Ayteks International Corporation, Midina, Ohio

Filed Jan. 11, 1971, Ser. No. 105,163

Int. Cl. C02c *5/02*

U.S. Cl. 210—50 **14 Claims**



An apparatus and method for precipitating and/or destroying a chemical material comprising a source of material connected in series with an acidification unit, a reduction unit, and a pH adjustment unit and with detention chambers between each unit and a container to allow settling of the newly formed material. This apparatus provides a circuit through which the reaction takes place within engineered volumes of piping surrounding the unit.

3,716,486

BRINE DRILLING FLUID LUBRICANT AND PROCESS FOR DRILLING SUBTERRANEAN WELLS WITH SAME

Alphonse C. Perricone, Houston, Tex., assignor to Milchem Incorporated, Houston, Tex.

Filed Mar. 18, 1971, Ser. No. 125,509

Int. Cl. C10m *3/40*

U.S. Cl. 252—8.5 C **9 Claims**

Enhanced lubricating properties can be obtained in a brine drilling fluid by utilizing an alkaline water soluble solution of a mono- and di-hydrogen phosphate ester of a five mole ethylene oxide adduct of a C_{10} linear saturated alcohol in a solvent selected from the class consisting of monohydric alcohols, water, and mixtures thereof and a silicone defoamer.

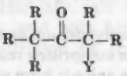
3,716,487

PROCESS FOR THE REMOVAL OF SCALE

Herman A. Bruson, Woodridge, Conn., and Henry Gould, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

Filed Sept. 23, 1971, Ser. No. 183,278
Int. Cl. C02b *5/06, 1/20*
U.S. Cl. 252—82 26 Claims

A process for the removal and inhibition of scale in aqueous environments utilizing a composition having the formula:



wherein R is $-CH_2-CH_2-COOX$, X being a member selected from the class consisting of hydrogen, alkali metals, ammonium and substituted ammonium, and Y is selected from the class consisting of hydrogen and $-CH_2CH_2-COOX$, X being a member selected from the class consisting of hydrogen, alkali metals, ammonium and substituted ammonium.

3,716,488

TEXTILE FABRIC CLEANING COMPOSITIONS

Rodger E. Kolsky, West Paterson, and Vernon Lindsay Chase, Butler, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 69,948, Sept. 4, 1970. This application Aug. 11, 1971, Ser. No. 170,856
Int. Cl. C11d *1/38, 3/26*
U.S. Cl. 252—155 8 Claims

According to the present invention, a stable aqueous composition of matter is provided that inhibits soiling and cooperates with select detergents to produce superior shampooing and cleaning action on application to textile fabrics. The soil pick-up inhibiting effect of the formulation is attributable to an aqueous composition of matter comprising finely divided particulate clay from the smectite group; an "essentially" water-soluble polymer, substantially free of chromophores, that dries to a tack-free, non-sticky residue characterized by anionic properties or the capacity to form an association complex for the purpose of carrying an electrolytic charge in the composition; and in effective soil pick-up inhibiting amounts, a disperse polymer with a Tg of at least 15° C. that is non-filmforming at ambient temperatures. The detergents that effectively cooperate with the soil pick-up inhibitors are detergents characterized by anionic or non-ionic properties in an alkaline medium ranging in pH up to about 11.

3,716,489

SUPERSATURATED SOLID SOLUTIONS OF PHOTOCHROMIC MATERIALS IN EPOXIES

Darwin Fiske DeLapp, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 2, 1970, Ser. No. 77,731
Int. Cl. G02c *7/10;* G02b *5/28;* F21v *9/00*
U.S. Cl. 252—300 9 Claims

A fast-acting photochromic filter consists of (1) a solid optically transparent epoxy matrix of (2) essentially free from non-combined, that is molecular oxygen, and for storage stability protected from diffusion of atmospheric oxygen, in which is (3) dispersed, in solid solution, at least one light absorbing compound having a polynuclear conjugated aromatic ring structure.

As many photochromic materials have low solubility in a matrix, and a solid solution is desired, both the epoxide component of the epoxy resin and the photochromic material are dissolved in a volatile solvent such as benzene, or a halogenated or alkylated benzene, and the solvent evaporated, to form a supersaturated solution, to which hardener is added before crystallization occurs.

Edge sealing of the glass by a polyvinyl alcohol, layer or a metal seal, or hermetic glass seal maintains oxygen exclusion.

3,716,490

TREATMENT OF RADIOACTIVE LIQUIDS

Norbert L. C. Van de Voorde, Mol, Belgium, assignor to Belgonucleaire S.A., Brussels, Belgium

No Drawing. Continuation-in-part of application Ser. No. 782,728, Dec. 10, 1968. This application June 3, 1969, Ser. No. 830,130
Claims priority, application Great Britain, Dec. 11, 1967, 56,172/67
Int. Cl. G21g *19/42*
U.S. Cl. 252—301.1 W 15 Claims

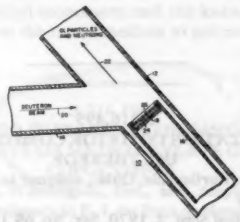
A method for decontamination of radioactive liquids and the products thereof, including contacting the radioactive liquid with an ion exchange material formed from a bituminous substance, such as asphalt, and thereafter compacting the ion exchange material, as by fusion and/or compression.

3,716,491

YTTRIUM-HYDROGEN ISOTOPE COMPOSITIONS FOR RADIOCHEMICAL REACTIONS

Lymperios N. Yannopoulos, 309 Edgewood Avenue, Apt. E, Pittsburgh, Pa.; Sven A. Jansson, 109 Glenfield Drive, and Earl A. Gulbransen, 63 Hathaway Court, both of Pittsburgh, Pa.

Filed July 9, 1969, Ser. No. 840,162
Int. Cl. C09k *3/00;* G21g *3/04*
U.S. Cl. 252—301.1 R 6 Claims



Compositions for radiochemical reactions including yttrium deuterides and tritides and solutions of deuterium and tritium in yttrium alloys with titanium and/or zirconium.

3,716,492

BIODEGRADABLE COMPOSITION FOR DETECTING SURFACE DISCONTINUITIES

Bruce C. Graham, Arlington Heights, and Ilmars Z. Dukats, Park Ridge, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed April 1, 1971, Ser. No. 130,537
Int. Cl. C09k *1/02;* G01n *21/16*
U.S. Cl. 252—301.2 P 7 Claims

A water washable, non-gelling colored liquid penetrant consisting essentially of a methyl ester of a fatty acid, a nonionic surfactant and a fluorescent dye, the methyl ester and the nonionic surfactant used being readily biodegradable and thereby rendering the penetrant as a whole non-polluting when subjected, without prior treatment, to the consuming action of microorganisms.

3,716,493

PROCESS FOR MAKING FINE SIZED LOW DENSITY SILICA

Ellsworth G. Acker, Baltimore, and Milton Edward Winyall, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 731,266, May 22, 1968. This application Feb. 26, 1971, Ser. No. 119,407
Int. Cl. B01j *13/00;* C01b *33/16*
U.S. Cl. 252—317 4 Claims

A solution of alkali metal silicate is partially neutralized with about 6% sulfuric acid to about pH 10.6–10.9, stirred

vigorously and completely neutralized with more sulfuric acid. After neutralization is complete, ammonia is added until a pH of greater than 7 is obtained. The thus formed slurry is then aged at about 80° C. for about 1 hour and filtered. The residue is washed with about 0.1% ammonium carbonate solution at about 80° C. and the thus washed solids are sized and dried. The resultant silica gel has a bulk density of about 0.03–0.10 g./cc., and a surface area of about 200–400 m.²/g.

3,716,494
DYE PENETRANT REMOVER

Orlando G. Molina, Westminster, Calif., assignors to North Americana Rockwell Corp., and Air Products and Chemicals, Inc., Allentown, Pa., part interest to each

Continuation-in-part of Ser. No. 606,593, Jan. 3, 1967, abandoned. This application Feb. 25, 1971, Ser. No. 118,980
Int. Cl. G01n *21/16, 21/38*
U.S. Cl. 252—408 **4 Claims**

Viscous compositions of gel-like consistency are disclosed for removing excess dye penetrant from parts subjected to liquid dye penetrant inspection. The compositions comprise a cleaner, a carrier, and a viscosity increasing agent, and have a viscosity between 10 and 100 poises at 100 reciprocal seconds.

3,716,495
POLYMERIZATION INITIATOR COMPOSITION AND USE THEREOF

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 2, 1970, Ser. No. 69,123
Int. Cl. C08f *1/28, 3/06*; C08d *1/14*
U.S. Cl. 252—431 L **18 Claims**

An initiator composition, formed by mixing: (a) an organolithium compound and (b) a hydrocarbyl metal compound wherein the metal is selected from Group 2*a*, 2*b*, or 3*a* of the Periodic Table, is employed in the presence of a polar compound selected from ethers, thioethers, and tertiary amines in the preparation of homopolymers and copolymers of conjugated dienes and vinyl-substituted aromatic hydrocarbons.

3,716,496
CATALYST COMPOSITION FOR THE OXIDATION AND THE OXIDATIVE DEHYDROGENATION OF OLEFINS

Takachika Yoshino, Yokohama; Shigeru Saito, Tokyo, and Yutaka Sasaki, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Sept. 2, 1970, Ser. No. 68,879
Claims priority, application Japan, Sept. 6, 1969, 44/70297
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 **4 Claims**

This invention provides a catalyst composition for an oxidation reaction selected from the group consisting of ammoxidation of olefins to nitriles, oxidation of olefins to aldehydes and oxidative dehydrogenation of olefins (C_4-C_8) to diolefins.

The catalyst composition has the empirical formula:

$Fe_{10}\ Sb_{20-60}\ Me_{0.01-1}\ Te_{0.05-5}\ Q_{0.1-30}\ O_{40-177}$ wherein Me is V, Mo and W ; Q is Cu, Ag, Be, Mg, Ca, Sr, Ba, Zn, Cd, La, Ce and Al.

The catalyst composition exhibits not only an improved catalytic activity in the reaction but also it shows desirable physical properties particularly fitted for a fluidized-bed reaction.

3,716,497
MANUFACTURE OF CATALYSTS OF THE IRON MOLYBDATE TYPE FOR USE PARTICULARLY IN THE CATALYTIC OXIDATION OF ALCOHOLS TO ALDEHYDES

Philippe Courty, Nanterre, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison, France

Filed Aug. 28, 1970, Ser. No. 68,000
Claims priority, application France, Sept. 8, 1969, 6930522
Int. Cl. B01j *11/22, 11/34*
U.S. Cl. 252—470 **14 Claims**

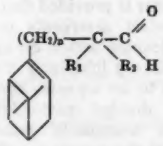
Manufacture of a molybdenum and iron containing catalyst in a four-stage process comprising reacting a solution containing molybdenum in an anionic form with a solution containing iron in a cationic form so as to obtain a precipitate, admixing said precipitate with an ammonium salt NH_4A,A being an anion, drying the resulting mixture at 40°–150°C and heating the dried product to 300°–500°C.

3,716,498
NOVEL FRAGRANCE COMPOSITIONS

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragances Inc., New York, N.Y.

Division of Ser. No. 874,038, Nov. 4, 1969, Pat. No. 3,636,113. This application April 2, 1971, Ser. No. 130,821
Int. Cl. A61k *27/00*
U.S. Cl. 252—522 **5 Claims**

Novel fragrance compositions comprising aldehydes having the structure:



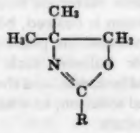
wherein R_1 is hydrogen or lower alkyl, R_2 is hydrogen or lower alkyl, and *n* is 1 or 2; lower alkyl acetals thereof, lower alkylene cyclic acetals thereof and mixtures thereof.

3,716,499
TERNARY FOAM CONTROL COMPOSITION AND BUILT ANIONIC DETERGENT COMPOSITION CONTAINING SAME

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Continuation-in-part of Ser. No. 41,359, May 28, 1970. This application May 28, 1970, Ser. No. 41,601
Int. Cl. B01d *19/04*; C11d *3/065*
U.S. Cl. 252—524 **24 Claims**

A built anionic detergent composition having an inverse foam to temperature relationship is disclosed, as well as a ternary composition for accomplishing this relationship when added to a detergent system. The inverse foam to temperature relationship is provided by a synergistic mixture of a C_6–C_{30} fatty acid, a polyethoxylated mono higher fatty alkyl quaternary ammonium halide, nitrate or sulfate containing about 10 to 50 mols of ethylene oxide and an oxazoline having the formula:



where R is C_{18} to C_{21} alkyl.

3,716,500
TOBACCO SMOKE FILTER MATERIAL

Elmer Francis Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,772

Int. Cl. A24d *1/06;* **C08g** *9/04*

U.S. Cl. 260—2.1 C **5 Claims**

An improved tobacco smoke filter material is formed from the porous, particulate salt of a weakly basic anion exchange resin, said salt being formed by the at least partial neutralization of the basic resin by a weak acid.

3,716,501
STABLE CARBONIUM ION RESINS AND METHOD OF PREPARATION

Joseph W. Rakshys, Jr., Framingham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 8, 1971, Ser. No. 122,239

Int. Cl. C08f *19/20*

U.S. Cl. 260—2.1 E **14 Claims**

Stable cross-linked carbonium ion resins having a plurality of triarylmethyl carbonium ion pendant groups are prepared by polymerizing a vinyl triaryl carbinol compound, alone or with a second monoolefinic monomer, and a poly-unsaturated monomer or by preparing a cross-linked polymer containing p-bromo or p-iodo styrene pendant groups, lithiating the polymer and reacting with an aromatic ketone and converting the triaryl carbinol to a carbonium ion. The cross-linked carbonium ion resins are useful as ion exchange resins for organic solvent systems.

3,716,502
ELASTOMERIC THERMOPLASTIC POLYESTER POLYURETHANE COMPOSITIONS STABILIZED AGAINST HYDROLYSIS

Frederic Christian Loew, Ridgewood, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,409

Int. Cl. C08g *51/56, 51/60, 53/08*

U.S. Cl. 260—2.5 AY **17 Claims**

Addition of small amounts of acidic silica to improve hydrolytic stability of polyurethanes.

3,716,503
STABILIZED SURGICAL ADHESIVE

John Johnston, Michigan City, Ind., assignor to Scholl, Inc., Chicago, Ill.

Filed Oct. 19, 1970, Ser. No. 82,110

Int. Cl. C08d *9/12;* **C08c** *9/18*

U.S. Cl. 260—3 **4 Claims**

Adhesive mass for surgical tape including a rubbery elastomer, zinc resinate, a filler or reinforcing agent and preferably a neutral resin.

3,716,504
PAPER COATING COMPOSITIONS AND PRODUCTS FORMED THEREFROM

Martin K. Lindemann, Somerville, and Rocco P. Volpe, Newark, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed Mar. 31, 1965, Ser. No. 444,388

Int. Cl. C08f *45/24;* **D21h** *3/44*

U.S. Cl. 260—8 **15 Claims**

A coating composition effective to deposit upon a fibrous web, such as paper or paperboard, a glossy, bright coating having desirable "pick" characteristics comprises an aqueous synthetic polymer latex and a mineral filler, the latex containing dispersed vinyl acetate-ethylene copolymer of 5 to 40%, preferably more than 15%, ethylene content, and characterized by an intrinsic viscosity of 1 to 2.5 deciliters per gram as measured in benzene at 30° C., the dispersed copolymer having a particle size of 0.1μ to 0.25μ, the latex preferably having a solids content of 35 to 70% of copolymer and 100 parts of filler preferably being present per 5 to 25 parts of latex solids.

3,716,505
PROCESS FOR SUSPENSION POLYMERIZATION

Keitaro Ohe; Daijiro Nishio; Shigeru Sadamtsu, and Hiroyuki Kaneko, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 22, 1970, Ser. No. 40,482

Claims priority, application Japan, May 23, 1969, 44/40057

Int. Cl. C08f *1/11*

U.S. Cl. 260—17 A **8 Claims**

A process for suspension polymerization of vinyl monomers in an aqueous liquid medium wherein an inorganic compound difficultly soluble in the liquid medium and a resinous substance, having a solubility parameter value of from 7.8 to 16.1 and being soluble in the vinyl monomers are kneaded in advance with the vinyl monomers, and the kneaded mixture is then suspended in the liquid medium to polymerize the vinyl monomers.

3,716,506
PROCESS FOR PREPARING AZIRIDINYL ALKYL-ACRYLATE OR METHACRYLATE GRAFT COPOLYMERS

John A. Simms, Wilmington, Del., and Aloysius N. Walus, Flint, Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

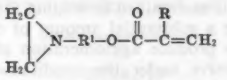
Filed Dec. 22, 1970, Ser. No. 100,793. The portion of the term of this patent subsequent to March 21, 1989, has been disclaimed.

Int. Cl. C08f *45/34, 45/36*

U.S. Cl. 260—22 CB **12 Claims**

The novel process for preparing a graft copolymer having a backbone segment and side chain segments comprises:

1. preparing a prepolymer which forms a side chain segment of the graft copolymer that contains at least one reactive group;
2. reacting the prepolymer and aziridinyl compound of the formula



wherein R^1 is an alkylene group having 1–8 carbon atoms and R is —H or —CH_3;

3. polymerizing the prepolymer with other ethylenically unsaturated monomer units to form that graft copolymer.

These graft copolymers are particularly useful in forming coating compositions which may be in the form of aqueous dispersions, organosols or lacquers and these compositions form useful finishes for trucks, automobiles, airplanes, appliances such as refrigerators, stoves, washing machines, and the like and can be used as primers and/or sealer compositions.

3,716,507

HYDROXYPROPYLMETHYLCELLULOSE AS A PROTECTIVE COLLOID IN VINYL MONOMER POLYMERIZATION

Ronald L. Glomski, and George K. Greminger, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 2, 1971, Ser. No. 120,324
Int. Cl. C08f *1/11, 1/13*
U.S. Cl. 260—17 R 4 Claims

An improvement in the process for preparing vinyl polymers in aqueous suspension, said improvement comprising the use of hydroxypropylmethylcellulose having a methoxyl degree of substitution of from 0.4 to 1.3 and a hydroxypropyl molar substitution of from 0.2 to 1.4 and a total substitution of at least 1.0 combined degree of methoxyl substitution and degree of hydroxypropyl molar substitution as the protective colloid in the water-phase of an oil-in-water suspension system.

3,716,508

AIR-DRIED COATINGS COMPOSITIONS COMPRISING POLYESTER RESINS AND A SATURATED ALIPHATIC ALDEHYDE

Sheldon N. Lewis, Willow Grove, and George A. Frank, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 9, 1971, Ser. No. 161,317
Int. Cl. C09d *3/64, 3/66*
U.S. Cl. 260—22 A 10 Claims

In accordance with the invention, new air-drying compositions for coating, impregnating, etc. have been discovered which are based on the reaction of fumaric esters with mono-, di- or polyaldehydes. The reaction involved is fast and cures rapidly with complete consumption of at least one of the reactants so that coatings and the like made from these compositions set quickly to a hard condition and do not overcure to an embrittled condition on ageing.

3,716,509

METHOD FOR AGGLOMERATING AND STABILIZING RUBBERY POLYMER LATICES

Alva F. Harris, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 84,137, Oct. 26, 1970. This application Jan. 12, 1972, Ser. No. 217,267
Int. Cl. C08f *47/02*
U.S. Cl. 260—23.7 A 19 Claims

There is disclosed a process for agglomerating latices of a rubbery polymer to provide larger particles. Contact is effected between a cationic exchange resin and an aqueous latex of a polymer which contains an organic acid salt emulsifying agent for the latex and sulfate and/or phosphate radicals chemically bonded to the polymer particles. The admixture is maintained in contact for a period sufficient to remove a substantial amount of the emulsifying agent cation to produce agglomeration of the particles, which are cohesive under the conditions of operation. Thereafter, the latex and exchange resin are separated and the latex is stabilized, such as by addition of a reagent furnishing a cation capable of regenerating the emulsifying agent. The process produces agglomeration with a minimum amount of coagulation, and it is especially well suited to use on a continuous basis.

3,716,510

SEALANT COMPOSITION

Steven G. Belak, Claymont, Del., and Lewis W. Hall, Jr., Chadds Ford, Pa., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,835
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 AS 3 Claims

A sealant composition suitable for heat sealing electrical conduits yet does not form a permanent bond without heat sealing, is made from about 65 to 85 weight percent of atactic polypropylene or atactic propylene-ethylene copolymer, 5 to 15 weight percent of carbon black, 5 to 10 weight percent of asphalt and 5 to 20 weight percent of petroleum mineral oil.

3,716,511

COATING COMPOSITION OF AN AQUEOUS DISPERSION OF COPOLYMERIC VINYLIDENE CHLORIDE

Vernon Charles Haskell, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1970, Ser. No. 96,293
Int. Cl. C08f *29/14, 45/44*
U.S. Cl. 260—29.6 RB 7 Claims

A coating composition comprising a dispersion of copolymer of vinylidene chloride wherein the copolymer is of between about 60 parts and about 95 parts by weight of vinylidene chloride in a dispersion medium of alcohol and a nitrogenous base; and a process for coating film structures of organic thermoplastic polymeric material characterized by applying the coating composition to a film structure and thereafter drying the coated film structure.

3,716,512

FOUNDRY MOLD COMPOSITION

Silvio Vargiu; Silvestro Pezzoli, both of Milan, and Pierluigi Abruzzi, Bergamo, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 5, 1971, Ser. No. 196,208
Claims priority, application Italy, Nov. 12, 1970, 31628 A/70
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.3 8 Claims

A foundry mold composition containing sand and a binder comprising a phenol-formaldehyde-urea-furfuryl alcohol resin with 5 parts or more ethylene glycol to every 100 parts of resin.

3,716,513

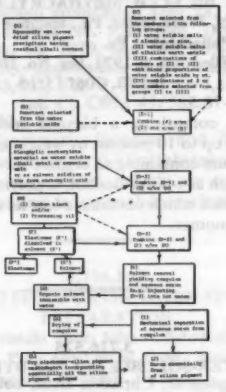
SILICA PIGMENTS AND ELASTOMER-SILICA PIGMENT MASTERBATCHES AND PRODUCTION PROCESSES RELATING THERETO

Oliver W. Burke, Jr., Fort Lauderdale, Fla. (1510 SW. 13th Court, Pompano Beach, Fla. 33061)

Continuation-in-part of abandoned application Ser. No. 798,215, Sept. 16, 1968, which is a division of application Ser. No. 611,250, Jan. 24, 1967, now Patent No. 3,523,096, which is a continuation-in-part of applications Ser. No. 458,420 and Ser. No. 458,379, both May 24, 1969, both now abandoned, and Ser. No. 479,806, Aug. 16, 1965, now Patent No. 3,401,017. This application July 16, 1970, Ser. No. 55,462
Int. Cl. C08c *11/10;* C08k *1/08*
U.S. Cl. 260—33.6 AO 14 Claims

Curbing of silica pigment losses and the promotion of uniformity of product in the preparation of an elastomer-silica pigment masterbatch are effected (a) by combining (1) an aqueously wet hydrated silica pigment precipitate which has a bound alkali content, which has been prepared by precipitation from an aqueous alkali metal silicate solution, and which has been continuously maintained in an aqueously wet state without having been dried therefrom after its precipitation, with (2) a quantity of oleophilic carboxylate material and (3) with selected coagulant for the carboxylate; (4) combining the resulting

treated wet silica pigment with a solvent dispersion of the elastomer, with or without (5) carbon black and/or processing oil, and (b) removing the solvent and aqueous phase and recovering the resulting combination as a masterbatch essentially without loss of silica pigment. A dispersible alkaline silica pigment composition and process for its production are also provided.



3,716,514

POLYAMIDE-IMIDE COMPOSITIONS CONTAINING GUANIDINE SALTS OF WEAK ACIDS AS BONDING AGENTS

Edwin F. Morello, Whiting, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed March 1, 1971, Ser. No. 119,874

Int. Cl. C08g *51/34*

U.S. Cl. 260—33.4 P 3 Claims

The adhesion of an amide-imide polymeric coating on a magnet wire is substantially improved by the addition of guanidine or guanidine salts of weak acids in the initial coating composition.

3,716,515

PROCESS OF MAKING SHELF-STABLE MIXTURES OF THIOL, OXIDIZER AND ACCELERATOR PRECURSOR

Gerhard Wilhelm, Viernheim, Lothar Hockenberger, Ludwigshafen, and Manfred Soyka, Lampertheim, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed June 14, 1971, Ser. No. 152,965

Claims priority, application Germany, Feb. 19, 1971, P 21 07 971.0

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 R 6 Claims

Mixtures based on liquid monomeric, oligomeric, or polymeric compounds having one or more terminal mercapto groups, containing as hardening agents peroxides of zinc or cadmium and, if desired, fillers, plasticizers and similar additives, are prepared by adding to said mixtures reaction products of Grignard compounds corresponding to the formula RMgX, wherein R stands for a lower alkyl or a phenyl-group and X stands for a halogen, with nitriles or amines, which react with the atmospheric moisture to form compounds which release and accelerate the oxidation reaction.

3,716,516

FLAME RETARDANT COMPOSITIONS OF MATTER

Robert A. Dombro, Ten UOP Plaza, Algonquin & Mt. Prospect Roads, Des Plaines, Ill.

Continuation-in-part of Ser. No. 772,045, Oct. 30, 1968, Pat. No. 3,661,937, which is a continuation-in-part of Ser. No. 408,673, Nov. 3, 1964, Pat. No. 3,452,083. This application Nov. 8, 1971, Ser. No. 196,774

Int. Cl. C08f *45/100*; C08g *51/100*

U.S. Cl. 260—45.8 A 11 Claims

Novel flame retardant compositions of matter comprising admixture of a polymeric compound and a halo-substituted dihydroxypolyhalomethanonaphthalenedicarboxylic acid or anhydride thereof as exemplified by an admixture of polypropylene and 1,4-dihydroxy-5,6,7,8,9,9-hexachloro-1,2,3,4,4*a*,5,8,8*ad*-octahydro-5,8-methano-2,3-naphthaneledicarboxylic acid.

3,716,517

SILOXANE POLYMERS FOR SOIL-REPELLENT AND SOIL-RELEASE TEXTILE FINISHES

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif. (both % Western Regional Research Laboratory, Berkeley, Calif. 94710)

No Drawing. Application June 28, 1971, Ser. No. 157,759, which is a division of application Ser. No. 38,899, May 19, 1970, now Patent No. 3,639,156. Divided and this application Mar. 2, 1972, Ser. No. 231,412

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 Y 2 Claims

Fluorocarbon silanes are copolymerized with silanes which contain two or more alkyleneoxy groups. The copolymers are useful for application to fibrous materials to provide both soil repellency and soil releasability.

3,716,518

SILOXANE POLYMERS FOR SOIL-REPELLENT AND SOIL-RELEASE TEXTILE FINISHES

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application June 28, 1971, Ser. No. 157,759, which is a division of application Ser. No. 38,899, May 19, 1970, now Patent No. 3,639,156. Divided and this application Mar. 2, 1972, Ser. No. 231,411

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 Y 3 Claims

Fluorocarbon silanes are copolymerized with silanes which contain two or more alkyleneoxy groups. The copolymers are useful for application to fibrous materials to provide both soil repellency and soil releasability.

3,716,519

METHOD FOR PRODUCING A POLYAMIDEIMIDE AND PRODUCT OF SAID METHOD

Naoya Yoda; Masaru Kurihara, both of Otsu; Noriaki Dokoshi, Kusatsu; Chiaki Tanaka, and Masaomi Eguchi, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 7, 1970, Ser. No. 61,914

Claims priority, application Japan, Aug. 11, 1969, 44/62868; Sept. 24, 1969, 44/75261

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CB 6 Claims

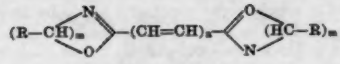
Polyamideimides are prepared by reacting a bis (tricarboxylic acid anhydride) anhydride with a primary diamine or an aminocarboxylic acid, and polymerizing the resulting oligomer composition with a diisocyanate.

3,716,520

COMPOSITION OF AN EPOXY RESIN AND 2,2-ALKYLENE BIS-2-OXAZOLINE AS CURING AGENT

Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 833,765, June 16, 1969. This application Jan. 28, 1971, Ser. No. 110,752
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN 1 Claim



$m = 2$ or 3
$n = 1 - 3$
R = H or alkyl C_{1-4}

useful as latent curing agents in polyepoxides to produce epoxy resins; to homopolymerize, or to copolymerize with dithiols; to homopolymerize or copolymerize ethylenically, or any combination of these:

3,716,521

ETHERIFIED OR ESTERIFIED PHENOLIC RESIN FIBERS AND PRODUCTION THEREOF

James Economy, Eggertsville; Francis J. Frechette, Tonawanda, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed March 31, 1971, Ser. No. 130,017
Int. Cl. C08g *5/18*
U.S. Cl. 260—59 24 Claims

Infusible cured phenolic resin fibers are reacted with a suitable reagent to block at least about 50 percent of the phenolic hydroxyl groups of the cured resin by esterification or etherification, whereby infusible cured phenolic resin fibers are obtained which have improved oxidation resistance and colorfastness and which are white.

3,716,522

AMIDE ACETAL INITIATED CHLORAL POLYMERIZATION PROCESS

Roe C. Blume, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1970, Ser. No. 89,135
Int. Cl. C08g *1/18, 3/00*
U.S. Cl. 260—64 22 Claims

Disclosed herein is a process for making chloral homopolymers, and copolymers with, for instance, isocyanates and ketenes, at temperatures between about 0° and 60° C. employing amide acetal initiators, and for making composites thereof with ethylenically unsaturated free-radical catalyzed polymers. The polymers are useful, inter alia, in building-product applications.

3,716,523

LOW CONCENTRATION STANNOUS CARBOXYLATE CATALYSIS OF POLYESTERIFICATION

William H. Cook, Bloomfield Hills, Mich., assignor to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 21, 1970, Ser. No. 82,848
Int. Cl. C08g *17/003*
U.S. Cl. 260—75 M 8 Claims

A method is provided for making a polyester having an acid number of less than 1 which involves heating a polyhydric alcohol and a polycarboxylic acid in the absence of a catalyst until an acid number of 30 or less is obtained and then continuing the esterification in the presence of a stannous salt of a carboxylic acid until the acid number is near zero.

3,716,524

T-BUTYL ALCOHOL/WATER COSOLVENT EMULSION COPOLYMERIZATION OF A MONOMERIC SYSTEM COMPRISING METHYL METHACRYLATE AND BICYCLIC METHACRYLATE

Harry J. Cenci, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 6, 1971, Ser. No. 104,519
Int. Cl. C08f *15/16*
U.S. Cl. 260—78.5 10 Claims

A mixture comprising a bicyclic methacrylate, methyl methacrylate, up to 10 percent by weight of ethyl acrylate, an aqueous medium containing an organic solvent that is substantially inert, such as t-butyl alcohol, is polymerized in emulsion to give a product which contains a low level of coagulum and of residual monomer.

3,716,525

WATER-SOLUBLE SULFUR DYESTUFFS

Friedrich Engelhardt; Christian Heid, both of Frankfurt am Main-Fechenheim; Willi Gunzert, Frankfurt am Main; Erwin Krusche, and Artur Meyer, both of Frankfurt am Main-Fechenhaim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

Filed Dec. 15, 1969, Ser. No. 885,322
Claims priority, application Germany, Dec. 17, 1968, P 18 15 133.2
Int. Cl. C09b *49/12*
U.S. Cl. 260—128 5 Claims

Water-soluble dyestuffs having an affinity for fibers and being capable to dyeing in the absence of reducing agents obtained by reacting water-insoluble sulfur dyestuffs, reduction products thereof or their thiosulfuric acid derivatives with alkylenimines and substituted derivatives thereof.

3,716,526

REFINING OF HEMICELLULOSES

Richard G. Schweiger, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Oct. 19, 1971, Ser. No. 190,656
Int. Cl. C08b *19/00, 29/08*
U.S. Cl. 260—212 3 Claims

Purification of crude hemicellulose by extracting with an aqueous organic acid.

3,716,527

PROCESS FOR PRODUCING FORMALDEHYDE-TREATED STARCH FREE OF UNREACTED OR FREE FORMALDEHYDE

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,816
Int. Cl. C08b *19/01*
U.S. Cl. 260—233.3 A 9 Claims

The invention is directed to a process for producing a formaldehyde-treated starch. A material which provides ammonium or amine groups is provided in a slurry of formaldehyde-treated starch containing free or unreacted formaldehyde at a pH of above about 6.5. The material combines with the free or unreacted formaldehyde and thus reduces vaporization of the formaldehyde.

3,716,528

DERIVATIVES OF IBOGAMINE, IBOGAINE AND IBOGALINE LACTAMS

Wataru Nagata, Nishinomiya, and Shoichi Hirai, Ibaraki, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Original application May 28, 1968, Ser. No. 732,520, now Patent No. 3,663,940. Divided and this application Oct. 14, 1970, Ser. No. 80,806

Claims priority, application Japan, June 3, 1967, 42/35,647; Feb. 7, 1968, 43/7,620

Int. Cl. C07d *43/38*

U.S. Cl. 260—239.3 P 10 Claims

Lactams of ibogamine, ibogaine and ibogaline compounds, such as 4-desethyl-18-p-toluensulfonyloxyibogamine lactam, are provided, which are useful as intermediates in preparing isoquinuclidine alkaloids useful as medicaments.

3,716,529

NOVEL C-16,17 SPIRO-ORTHOESTER STEROIDS AND PREPARATION

Jack Ackrell, Mountain View; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex Corporation, Panama, Panama

Filed May 14, 1970, Ser. No. 37,292

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 D 23 Claims

C-16,17 spiro-orthoesters and method of preparation involving reacting a 16,17-dihydroxy steroid with an O-alkyl alkanoic acid lactonium tetrafluoroborate in the presence of a base. The novel spiro-orthoesters are useful anti-inflammatory agents.

3,716,530

HALOGENATION OF STEROIDS

Alan Martin Krubiner, Montville, and Eugene Paul Oliveto, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 10, 1971, Ser. No. 170,639

Int. Cl. C07c *173/00*, *169/08*

U.S. Cl. 260—239.55 C 13 Claims

A process for converting 17α-vinyl-17β-hydroxy steroids to 17-(2-haloethylidene)-steroids known intermediates for antifungal and progestational agents, by treating the 17α-vinyl-17β-hydroxy steroids with vanadium tetrahalide.

3,716,531

5-NITRO-FURFURYLIDENE ANTIMICROBIC AGENTS

Rudolf Albrecht; Eberhard Schroder, both of Berlin, Germany, and Mahmoud Muftic, Cornavin-Geneve, Switzerland, assignors to Schering AG, Berlin and Bergkamen, Germany, by said Albrecht and Schroder

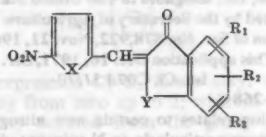
Filed Oct. 31, 1968, Ser. No. 804,333

Claims priority, application Germany, Nov. 14, 1967, Sch 41572

Int. Cl. C07d *5/30*

U.S. Cl. 260—240 A 13 Claims

For combating and preventing infections caused by a variety of microbes such as bacteria and *Trichomonas vaginalis*, new compounds of the formula



wherein

X is O, S or NH;

Y is O; S; $—CH_2—O—$; $—S—CH_2—$; $—CH_2—S—$; $—O—CH_2—$; $—SO—$; $—SO—CH_2—$; $—CH_2—SO—$; $—CH_2—_2—$; $—SO_2—CH_2—$ or $—CA_2—$, A being H, methyl, ethyl or phenyl; and

R_1, R_2 and R_3 each represents alkyl, hydroxy, hydroxyalkyl, alkoxy, alkoxyalkyl, alkoxyalkoxy, mono- or dialkylaminoalkyl, dialkylaminoalkoxy, amino, acylamino, mono- or dialkylamino, alkylsulfonylamino, acyloxy, alkylsulfonyloxy, benzyloxy groups wherein each alkyl, alkoxy or acyl residue is not more than five carbon atoms and acyl is derived from a carboxylic acid; halogen; or hydrogen with the provision that when Y represents $—CH_2—_1$, R_2, and R_3 is other than hydrogen.

3,716,532

PROCESS FOR PREPARING CRYSTALLINE FORMS OF 4,4'-BIS[(4-ANILINO-6-MORPHOLINO-1,3,5-TRIAZIN-2-YL)-AMINO]-STILBENE-2,2'-DISULFONIC ACID

Christopher Tscharner, Neumattenweg 9, Benken-Baselland, Switzerland; Maurice Schwarz, 15 Appletree Lane, and Richard Pichler, 11 Westfield Rd., both of Warwick, R.I.

Filed April 13, 1970, Ser. No. 27,587

Int. Cl. C07d *55/22*

U.S. Cl. 260—240.1 3 Claims

Novel crystalline 4,4'-bis[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)-amino]-stilbene-2,2'-disulfonic acid is provided by a procedure involving treating cyanuric chloride with 4,4'-diaminostilbene-2,2'-disulfonic acid, reacting the product thus obtained, without isolation, with aniline followed by reacting the resulting product, without isolation, with morpholine and precipitating the product thus obtained by treatment with an acid.

The new crystalline 4,4'-bis[(4-anilino-6-morpholino-1,3,5-triazin-2-yl)-amino]-stilbene-2,2'-disulfonic acid is incorporated in detergents, soaps or other laundry products and imparts to the aforesaid and similar materials, unexpected and surprising superior over-all performance properties.

3,716,533

N-DEFORMYLATION OF 3-HALOMETHYL-7β-FORMAMIDOCEPHALOSPORIN-1-OXIDES

David Cedric Humber, Greenford, England, assignor to Glaxo Laboratories Limited, Greenford, England

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,125

Claims priority, application Great Britain, July 10, 1970, 33,697/70

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 8 Claims

A process for the preparation of 7β-aminocephem-4-carboxylic acids and derivatives thereof comprises N-deformylating a 7β-formamidocephem-4-carboxylic acid or derivative thereof with a Lewis acid in a lower alkane diol under substantially anhydrous conditions.

3,716,534

THIADIAZOLES[3,4-D]-PYRIDAZINES

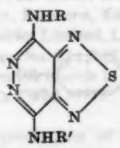
James Bernard Sieja, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 13, 1971, Ser. No. 133,722

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 6 Claims

Thiadiazolo[3,4-d]Pyridazines of the formula



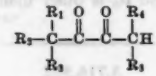
are colored compounds useful as color screens, dye intermediates and pigments.

3,716,535
TRIMERIZATION OF ISOCYANATES

Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI America Inc.

No Drawing. Filed Feb. 27, 1968, Ser. No. 708,484
Int. Cl. C07d 55/38
U.S. Cl. 260—248 NS 9 Claims

Aromatic isocyanates are trimerized with a catalyst system which comprises a mixture of at least one tertiary amine and at least one co-catalyst selected from the group consisting of benzoyl peroxide and compounds having the formula



wherein R_1 and R_4 are independently selected from the group consisting of hydrogen, alkyl groups having from 1 to 4 carbon atoms, and aryl groups, R_2, R_3, and R_5 are independently selected from the group consisting of hydrogen and alkyl groups having from 1 to 4 carbon atoms, and the total number of carbon atoms in the alkyl group is from 1 to 10. The reaction is divided into two stages. The first stage is an initiation period during which substantially no polymerization occurs. The second stage is the rapid trimerization of the isocyanate.

3,716,536
METHOD OF PREPARING BENZOGUANAMINES

Peter Herman Gund, Hightstown, and Gerald Berkelhammer, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 17, 1971, Ser. No. 181,631
Int. Cl. C07d 55/20
U.S. Cl. 260—249.9 7 Claims

A process for the preparation of benzo and substituted benzoguanamines, is described.

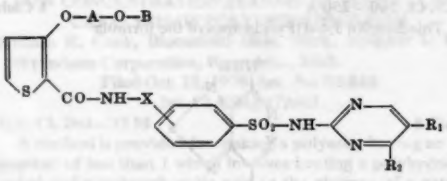
These compounds are useful as intermediates in the preparation of thermosetting resins, pharmaceuticals and the like.

3,716,537
CERTAIN THENOYL DERIVATIVES OF BENZENSULFONYLAMINOPYRIMIDINES

Ruth Heerdt, Mannheim-Fendenheim; Manfred Hubner, Ludwigshafen/Rhine; Felix Helmut Schmidt, Mannheim-Seckenheim, and Rudi Weyer, Frankfurt/M.-Unterliederbach, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed June 1, 1970, Ser. No. 42,512
Claims priority, application Germany, June 7, 1969, P 19 29 232.5
Int. Cl. C07d 51/42
U.S. Cl. 260—256.5 R 9 Claims

Certain novel sulfonylaminopyrimidines having the general formula



wherein A is a lower alkylene radical, B is a lower alkyl radical, X is a straight or branched-chain lower alkylene radical, R_1 is a straight or branched-chain alkyl, cycloalkyl, cycloalkylalkyl, aryl, e.g., phenyl or naphthyl, aralkyl, e.g., benzyl or naphthyl-ethyl, alkoxy, cycloalkoxy, alkoxyalkyl, alkoxyalkoxy or alkylmercapto radical and R_2 is a hydrogen atom or a lower alkyl radical and wherein R_1 and R_2 can, together, also form an alkylene ring of three to five methylene radicals, as well as the physiologically compatible salts thereof, have strong blood sugar reducing activity.

3,716,538
AMINOMETHYLPHENYLBICYCLONONENOLS

Robert Norman Schut, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sept. 9, 1970, Ser. No. 70,884
Int. Cl. C07d 51/70
U.S. Cl. 260—268 BC 4 Claims

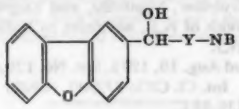
Certain aminomethyl-9-phenylbicyclo[3.3.1]-non-3-en-9-ols and acid addition salts thereof as well as methods for their preparation are disclosed. These compounds exhibit analgesic and tranquilizer activity.

3,716,539
1(2-DIBENZOFURYL)4-PIPERAZINO BUTANOLS

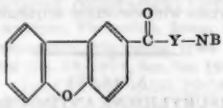
Harvey B. Hopps, West Allis, Wis.; Dennis Jackman, University, Miss., and John H. Biel, Lake Bluff, Ill., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 693,765, Dec. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 605,995, Dec. 30, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,066, June 7, 1965, abandoned. This application May 19, 1971, Ser. No. 145,069
Int. Cl. C07d 51/70
U.S. Cl. 260—268 TR 8 Claims

Compounds of the formula



which possess hypotensive activity and are useful for treating hypertension in mammals and compounds of the formula



which are useful as intermediates in the preparation of the foregoing hypotensive agents and also in some cases exhibit hypotensive, sedative and muscle relaxant activity and processes for the preparation of the foregoing compounds. In the foregoing formulas, NB is a primary or secondary amino radical and Y is (lower)alkylene.

3,716,540
HEXACHLOROPENTADIENE ADDUCTS OF UNSATURATED PIPERAZINE AMIDES

Robert R. Mod; Frank C. Magne, and Evald L. Skau, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture

Continuation of Ser. No. 878,922, Nov. 21, 1969, Pat. No. 3,663,582. This application Dec. 16, 1971, Ser. No. 208,953
Int. Cl. C07d 51/70
U.S. Cl. 260—268 C 2 Claims

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and N,N-disubstituted piperazine amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadecenoic or 10-undecenoic acids.

The compounds which are the subject of this invention are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as plasticizers.

3,716,541

SUBSTITUTED DERIVATIVES OF 10,11-DIHYDRO-5,10-(IMINOMETHANO)-5H-DIBENZO, CYCLOHEPTENES AND PREPARATION THEREOF

Thomas A. Dobson, Dollard-des-Ormeaux, Montreal, Quebec, and Martin A. Davis, Montreal, Quebec, Canada, assignors to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

Filed July 23, 1970, Ser. No. 57,792. The portion of the term of this patent subsequent to Aug. 3, 1988, has been disclaimed.

Int. Cl. C07*l 39/00*

U.S. Cl. 260—286 R **21 Claims**

There are disclosed herein 11-oxo-, 11-hydroxy-, 11-acyloxy-, 11-alkoxy-, and 11-(substituted amino)- derivatives of 10,11-dihydro-5,10-(iminomethano)-5H-dibenzo-[*a,d*] cycloheptene, and their corresponding 12-alkyl-, 12-alkenyl-, 12-cycloalkyl-, 12-aralkyl-, 12-dialkylamino-alkyl-, 13-alkyl-, 13-aralkyl- and 13-aryl- derivatives. The compounds are useful central nervous system depressants and methods for their preparation and use are given.

3,716,542

PROCESS FOR THE PREPARATION OF ISOCARBOSTYRILS

Rene Lenaers, Brussels; Ernest H. de Ruiter, Beersel, and Jan J. Vandewalle, Mortsel, all of Belgium, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1970, Ser. No. 101,146

Int. Cl. C07d *35/30*

U.S. Cl. 260—289 R **10 Claims**

Isocarbostyrils are conveniently prepared in high yields and in a high degree of purity by contacting an isoquinoline with an anhydrous, liquid melt mixture of potassium hydroxide and sodium hydroxide.

The anhydrous, melt mixture is prepared by reacting potassium hydroxide with an amount of sodium oxide sufficient to consume all the water present and then heating the mixture to its melting point. Thereafter the isoquinoline is added and upon completion of the reaction, water is introduced to hydrolyze the potassium isocarbostyril salt. Isocarbostyrils are useful as intermediates in the production of dyes, pharmaceuticals, antioxidants, and surfactants.

3,716,543

C_{10}–C_{13} HYDROCARBYL SUBSTITUTED PYRIDINE COMPOUNDS

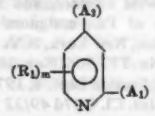
John B. Hall, Rumson, N.J., assignor to International Flavors and Fragrances Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 854,787, Sept. 2, 1969. This application July 28, 1970, Ser. No. 59,027

Int. Cl. C07d *31/20*

U.S. Cl. 260—290 V **9 Claims**

Novel nitrogen heterocyclic compounds defined by the structure:



wherein R_1 represents C_1–C_3 lower alkyl and m is an integer ranging from zero up to 2; wherein one of A_1 or A_2 is a moiety selected from the group consisting of cyclododecen - 3 - yl-methyl, 2-pinen-10-yl-methyl, 4,8-dimethyl - 3,7 - nonadienyl, 3-methyl - 6 - i-propyl-2-cyclohexenyl-methyl, and 1,4,8-trimethyl - 3,7 - nonadien-1-yl; and the other of A_1 or A_2 is R_1 or hydrogen.

3,716,544

CERTAIN 6,11-DIHYDRO-11-(3-ALPHA-TROPANYLOXY)-DIBENZO[B,E]THIEPINE-5-OXIDES AND THE CORRESPONDING DIOXIDES AND DERIVATIVES THEREOF

Fulvio Gadient, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

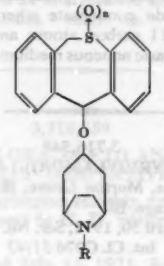
Filed July 13, 1971, Ser. No. 162,290

Claims priority, application Switzerland, July 15, 1970, 10735/70; July 15, 1970, 10736/70; July 15, 1970, 10737/70; July 15, 1970, 10738/70

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **5 Claims**

The invention concerns new dibenzothiepines of the formula:



wherein R is alkyl of one to four carbon atoms and n is 1 or 2, or

R is alkyl of two to four carbon atoms and n is 0,

and pharmaceutically acceptable acid addition salts thereof. The compounds are useful in the prophylaxis and treatment of gastric ulcers.

3,716,545

OXIDATIVE CONVERSION INCLUDING DEHYDROGENATION

Dennis L. Ripley, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of Ser. No. 769,428, Oct. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 693,186, Dec. 26, 1967, abandoned. This application Jan. 16, 1970, Ser. No. 4,470

Int. Cl. C07c *5/18*

U.S. Cl. 260—290 V **16 Claims**

Oxidative conversion of olefins and/or diolefins including the dehydrogenation of organic compounds is carried out with an iron-phosphorus-oxygen catalyst wherein the amount of phosphorus is greater than the stoichiometric amount required to react with all of the iron in the catalyst and form monophosphate ions (PO_4^{-3}). The activity of the phosphorus-containing catalyst can be maintained by continuous or intermittent addition of phosphorus containing compounds.

3,716,546

PRODUCTION OF BIPYRIDYLIUM SALTS AND RELATED COMPOUNDS

John Edward Colchester, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 811,249, March 27, 1969, abandoned. This application March 1, 1971, Ser. No. 119,893

Int. Cl. C07d *31/42, 31/44*

U.S. Cl. 260—295 AM **4 Claims**

A process for the production of 1,1′-disubstituted-4,4′-bipyridylium salts which comprises reacting the corresponding 1,1′-disubstituted-1,1′,4,4′-tetrahydro-4,4′-bipyridyl with a free radical compound.

3,716,547

PROCESS FOR THE PREPARATION OF A POLY(VINYL ACETATE-DIALKYL MALEAEE-ACRYLIC ACID) TEXTILE SIZES

Albert E. Corey, East Longmeadow; Donald D. Donermeyer; Joel Fantl, both of Springfield, and Charles R. Williams, Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1970, Ser. No. 98,914
Int. Cl. C08f 1/13; D06c 27/00
U.S. Cl. 260—29.6 TA 17 Claims

Disclosed herein is a process for the preparation of a poly(vinyl acetate-dialkyl maleate-acrylic acid) textile size which comprises (1) interpolymerizing the monomers at a temperature of from 40° to 60°C. to form a latex using a surfactant system comprising a phosphate ester of an alkyl phenolethylene oxide condensate wherein the alkyl group contains seven to 11 carbon atoms; and (2) dissolving the resulting latex in a basic aqueous medium to form the size.

3,716,548

2-(CHLOROPYRIDYLAMINO)-1-PYRROLINES

Fred M. Hershenson, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed April 30, 1971, Ser. No. 139,175
Int. Cl. C07d 31/42
U.S. Cl. 260—296 R 1 Claim

1-Pyrrolines having a chloropyridylamino substituent at the 2-position are described herein. The compounds involved are useful as anti-hypertensive agents. To prepare the present compounds, 2-pyrrolidinone is reacted with phosphorus oxychloride and the resulting product is then reacted with an aminopyridine.

3,716,549

PYRIDINE-BIS-(HYDROXYARYL ETHERS) AND DERIVATIVES THEREOF

Gerhard Darsow, and Hermann Schnell, both of Krefeld-Verdingen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 29, 1970, Ser. No. 51,018
Claims priority, application Germany, July 10, 1969, P 19 34 889.1
Int. Cl. C07d 31/30
U.S. Cl. 260—297 R 3 Claims

Title products are described which are useful intermediates for the production of synthetic resins such as saturated and unsaturated polyester resins, polycarbonates and epoxy resins and which are prepared by reacting 2,6-dichloropyridine with a dialkali phenolate in the molar ratio of approximately 1:2 in the presence of a polar organic solvent at about 60° to about 180°C and acidifying the reaction mixture.

3,716,550

PROCESS FOR THE PREPARATION OF VINYLTETRAZOLE

William H. Gilligan, Washington, D.C.; Chilton H. McDonnell, Indian Head, and Orlando Jones, Pisgah, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 29, 1969, Ser. No. 872,432
Int. Cl. C07d 55/56
U.S. Cl. 260—308 D 16 Claims

Improved processes for the preparation of 1-and 2- alkyl-5-vinyltetrazoles which involve the reaction of an ammonium azide and a β-dialkylaminopropionitrile in a water solvent and alkylating the product thereof under a carefully maintained pH.

3,716,551

DEUTERATED L-AMINO ACID MIXTURE

Irving Putter, Martinsville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed July 17, 1969, Ser. No. 842,715
Int. Cl. C07d 49/36
U.S. Cl. 260—309 8 Claims

A mixture of naturally occurring L-amino acids in deuterated form and a method for the preparation of such a mixture which consists in treating deuterated algae with acid to afford a protein residue which is then hydrolyzed, concentrated, filtered, adsorbed upon a suitable ion exchange resin and recovered by conventional means.

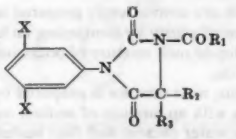
3,716,552

N⅛-ALKANOYL-N⅛⅛-DIHALOPHENYL IMIDAZOLIDINEDIONES

Akira Fujinami, Ashiya; Toshiaki Ozaki, Toyonaka; Keiichiro Akiba, Ikeda; Sigeo Yamamoto, Toyonaka; Katsuji Nodera, Nishinomiya; Katsutoshi Tanaka, Takarazuka; Nobuyuki Kameda, Takarazuka, and Tadashi Ooishi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 5, 1970, Ser. No. 78,263
Claims priority, application Japan, Oct. 9, 1969, 44/80887
Int. Cl. C07d 49/34
U.S. Cl. 260—309.5 10 Claims

Novel 3-(3′,5′-dihalogenophenyl)-1-acylimidazolidine-2,4-diones of the formula,



wherein X is a halogen atom, R_1 is a lower alkyl group, a lower alkenyl group, or a halogenated lower alkyl group having one to three halogen atoms, and R_2 and R_3 are individually a hydrogen atom or a lower alkyl group. The novel imidazolidinediones have high microbicidal activities on various fungi and bacteria and are non-toxic to mammals and plants. The imidazolidinediones are prepared by reacting a corresponding 1-unsubstituted 3-(3′,5′-dihalogenophenyl) imidazolidine-2,4-dione derivative with a corresponding acylating agent.

3,716,553

1,3-DIAZASPIRO [4,4]NON-7-ENE-2,4-DIONE

Harvey E. Alburn, West Chester, and Horace Fletcher, III, Montgomery, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 777,506, Nov. 20, 1968, Pat. No. 3,594,413. This application Sept. 4, 1970, Ser. No. 69,911
Int. Cl. C07d 49/32
U.S. Cl. 260—309.5 1 Claim

This invention is concerned with the preparation of cyclopentene-1,1-dicarboxamides; 1,3-diazaspiro [4,4] nonene-2,4-dionen; 1-aminocyclopentene-1-carboxylic acids; 1-(N-alkylamino)cyclopentene-1-carboxylic acids; and 3-oxa-1-azaspiro [4,4] nonene-2,4-diones which are intermediates in the preparation of 6-(1-aminocyclopentene-1-carboxamido)penicillanic acids which are useful antibacterial agents.

3,716,554

N-(CHLOROPHENOXYACETYL)ETHYLENE UREA HERBICIDES

Edwin D. Little, Convent Station, N.J., and Clarence A. Hirsch, Indianapolis, Ind., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 825,986, May 19, 1969, Pat. No. 3,639,115. This application May 17, 1971, Ser. No. 144,400
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 2 Claims

N-(Chlorophenoxyacetyl)ethylene ureas are prepared by reacting ethylene urea with a chlorophenoxyacetyl chloride. The products are useful herbicides.

3,716,555

NEW 5-NITROFURYL DERIVATIVES

Graham Arton Howarth, Wilmslow, and James Gainer, Tyldesley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,512
Claims priority, application Great Britain, Sept. 9, 1970, 43,056/70
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 5 Claims

Compounds of the class of 4-cyano-5-alkoxymethylenamino-3-(5-nitro-2-furyl)-pyrazole have antimicrobial properties and are active ingredients in pharmaceutical compositions and animal feedstuff compositions; an illustrative example is 4-cyano-5-ethoxymethylenamino-1-methyl-3-(5-nitro-2-furyl)-pyrazole.

3,716,556

1,3,2-OXAZABORINIDES AND METHOD FOR PREPARING THE SAME

Thurairajah Padmanathan, Highland Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 732,045, May 27, 1968, Pat. No. 3,621,023. This application April 19, 1971, Ser. No. 135,385
Int. Cl. C02d *27/54*
U.S. Cl. 260—326.3 2 Claims

Condensed difluoro or diacetoxy 1,3,2-oxazaborinides are prepared by treating (a) a condensation product of a naphthostyril with an active ketomethylene compound, such as barbituric acid or its N,N-dialkyl derivatives, an indandione, an oxindole or a pyrazolone, (b) a condensation product of an o-hydroxybenzaldehyde with an aromatic amine, or (c) an ortho-(benz-azol-2yl)-naphthol or phenol, the azole being oxazole, thiazole or imidazole, with either (1) boron trifluoride dissolved in ether, or (2) orthoboric acid, benzeneboronic acid or esters thereof, in acetic acid in the presence of acetic anhydride, at reflux. The difluoro and diacetoxy-1,3,2-oxazaborinides are characterized by affinity for polyesters when applied by disperse dyeing methods and fluoresce on the fiber. Similar effects are obtained on nylon and acetate and to some extent on modified polyacrylonitrile.

3,716,557

1,2-EPITHIO-3-(-CYANOETHOXY)PROPANE

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company

Continuation-in-part of Ser. No. 806,777, Feb. 28, 1969. This application March 30, 1970, Ser. No. 24,001
Int. Cl. C07d *59/00, 1/00*
U.S. Cl. 260—327 E 1 Claim

Compounds having terminal oxirane groups are formed by reaction of glycidol, under base-catalyzed conditions, with vinyl-type compounds, e.g., acrylonitrile, acrylic esters, vinyl ketones, vinyl sulfones and the like. The resulting products can be converted to terminal thiirane group compounds by reaction with thiocyanates. The compounds are useful as comonomers in production of copolymers and as cure accelerators for epoxy-amine resinous compositions.

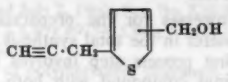
3,716,558

5-PROPARGYL THENYL ALCOHOLS

Nobushige Itaya, Minoo-shi, and Toshio Mizutani, Hirakata-shi, both of Japan, assignors to Sumitomo Chemical Company Ltd., Osaka, Japan

Filed April 23, 1970, Ser. No. 31,368
Claims priority, application Japan, May 14, 1969, 44/37203
Int. Cl. C07d *63/12*
U.S. Cl. 260—332.3 R 1 Claim

5-Propargyl thenyl alcohol having the formula,



which may be useful as an intermediate for the production of pyrethroidal insecticides such as 5-propargyl-thenyl chrysanthemates.

3,716,559

4-METHYLEN-2-OXA-3-KETO ANDROSTANES AND 4-METHYL-Δ^4 DERIVATIVES THEREOF

Robert J. Chorvat, Arlington Heights, and Raphael Pappo, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed July 13, 1971, Ser. No. 162,294
Int. Cl. C07d *7/18*
U.S. Cl. 260—343.2 S 6 Claims

The reaction of 2-oxa-3-keto androstanes with formaldehyde affords the corresponding 4-methylene derivatives, which are rearranged by treatment with palladium catalyst to afford the corresponding 4-methyl-Δ^4 derivatives. Both the 4-methylene and 4-methyl-Δ^4 compounds are pharmacologically active as is evidenced by their anabolic and androgenic properties.

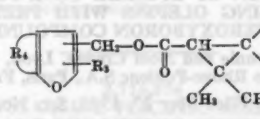
3,716,560

4,5-TETRAMETHYLENE FURFURYL AND 4,5-TETRAMETHYLENE-3-FURYLMETHYL CHRYSANTHEMATES

Nobushige Taya, Minoo; Toshio Mizutani, Hirakata; Shigeyoshi Kitamura; Yositosi Okuno, both of Toyonaka, and Keimei Fujimoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed March 26, 1970, Ser. No. 22,995
Int. Cl. C07d *5/36*
U.S. Cl. 260—346.2 R 5 Claims

Cyclopropanecarboxylic acid esters represented by the formula,



wherein R_1 represents hydrogen or methyl; R_2 represents methyl, 2-methyl-1-propenyl or 2-methoxy-carbonyl-1-propenyl when R_1 is hydrogen and R_2 represents methyl when R_1 is methyl; R_3 represents hydrogen or methyl; and R_4 represents a lower alkylene radical containing or not containing oxygen or sulfur atom in its carbon chain, the alkylene having up to four carbon atoms, which may be useful as insecticides having high insecticidal effects and low toxicity to mammals.

3,716,561

SELECTIVE ALLYLIC OXIDATION PROCESS

David Andrews, Upper Montclair, and Gabriel Saucy, Essex Fells, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Apr. 21, 1969, Ser. No. 818,142. Divided and this application Apr. 30, 1971, Ser. No. 139,188

Int. Cl. C07d 7/04

U.S. Cl. 260—345.9 2 Claims

Multi-step processes for the preparation of tricyclic intermediates useful in the total synthesis of steroids are described. A first process step involves treatment of a dihydroxy, divinyl compound with both manganese dioxide and an amine to produce a Mannich base intermediate. The resulting Mannich base intermediate may be reduced catalytically and then coupled with a cyclic dione to yield a tricyclic keto diene. This compound can be reduced to yield a tricyclic hydroxy compound useful as an intermediate in the total synthesis of steroidal compounds having known valuable pharmacological properties. Alternatively, it is possible to directly couple the Mannich base with the cyclic diketo compound followed by reduction and catalytic hydrogenation to yield the tricyclic hydroxy compound.

3,716,562

PROCESS FOR PREPARING OLEFIN OXIDES

Gianfranco Pregaglia; Giorgio Montorsi; Giuseppe Caprara, all of Milan, and Giuseppe Messina, Alghero, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 10, 1971, Ser. No. 151,979

Claims priority, application Italy, June 12, 1970, 25901 A/70

Int. Cl. C07d 1/06

U.S. Cl. 260—348.5 V 10 Claims

Olefin oxides are prepared with greatly improved yield in the liquid phase reaction of olefins, aldehydes, the carbonyl group of which is bound to tertiary or secondary carbon atom, by conducting the process in two stages. In the first stage the gas containing oxygen is reacted in the liquid phase with the olefin and aldehyde at a temperature of 0°–120° C., wherein the olefin/aldehyde molar ratio is between 50 : 1 and 1 : 1, until at least 35 percent conversion of the aldehyde. In the second stage in which the oxygen feed is preferably interrupted, the reaction is continued at a temperature of 50°– 150° C. in the presence of a catalyst selected from the group consisting of compounds of molybdenum, titanium, tungsten, vanadium and combinations thereof.

3,716,563

PREPARATION OF EPOXIDE COMPOUNDS BY EPOXIDIZING OLEFINS WITH PREFORMED ORGANOPEROXYBORON COMPOUNDS

Jean-Claude Brunie and Noël Crenne, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed May 27, 1966, Ser. No. 553,283

Claims priority, application France, June 1, 1965, 19,139

The portion of the term of the patent subsequent to Jan. 2, 1990, has been disclaimed

Int. Cl. C07d 1/08

U.S. Cl. 260—348.5 L 3 Claims

Epoxidized compounds are manufactured by oxidizing olefinic compounds with triorganoperoxyboranes as epoxidizing agent.

3,716,564

AZA ALIPHATIC ESTERS

Virginia L. Spain, Mountain View, and John D. Diekman, Menlo Park, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed May 13, 1971, Ser. No. 143,183

Int. Cl. C08h 17/36

U.S. Cl. 260—404 11 Claims

Novel aza α, β-unsaturated aliphatic esters prepared by the reaction of an aliphatic nitrile with a di-unsaturated aliphatic ester in the presence of mercuric nitrate followed by reduction with sodium borohydride useful for the control of insects.

3,716,565

3,4-ALLENIC FATTY ACID ESTERS

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,768

Int. Cl. C07c 69/52, 103/56, 33/04

U.S. Cl. 260—410.9 R 13 Claims

Preparation of di-unsaturated and tri-unsaturated aliphatic esters and amides by reaction of alkynyl alcohol with orthoester or amide ketal to prepare allenic ester or amide and rearrangement of allene, useful for insect control.

3,716,566

METHOD OF DECOMPOSITION AND/OR WET INCINERATION OF ORGANIC MATERIAL, ESPECIALLY BIOLOGICAL SUBSTANCES

Bruno Otto Sansoni, Lohhof-Sud, and Wolfgang Karl Heinrich Kracke, Munich, Germany, assignors to Gesellschaft fur Strahlenforschung m.b.H., Neuherberg, Germany

No Drawing. Filed June 18, 1969, Ser. No. 834,526

Claims priority, application Germany, July 2, 1968, P 17 73 750.7

Int. Cl. C09f 5/00

U.S. Cl. 260—412.8 11 Claims

A method of decomposition and/or wet incineration of organic substances such as meat, fish, flour, bone, vegetables, milk powder, cellulose, ion exchange resins or the like. The substances are decomposed in aqueous suspension by subjecting them to attack of the radicals $\cdot OH$ or $\cdot HO_2$.

3,716,567

SIMULTANEOUS PRODUCTION OF ALCOHOLATES AND TRIVALENT TITANIUM COMPLEXES OF BETA-DIKETONES

Erich Termin, Laufenburg, and Gerhard Hauck, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Sept. 8, 1970, Ser. No. 70,580

Claims priority, application Germany, Sept. 6, 1969, P 19 45 303.3

Int. Cl. C07f 7/28

U.S. Cl. 260—429.5 9 Claims

Tetravalent titanium alcoholate-beta diketone complexes, e.g. titanium isopropylate-triacetylacetonate, are reacted with an alkali metal amalgam in a non-polar solvent to reduce the titanium to trivalent state, forming, for example, titanium triacetylacetonate and sodium isopropylate. The sodium isopropylate is a crystalline precipitate which can be removed by filtration; the amalgam can be decanted off and reused, as in alkali metal chloride electrolysis, to restore its alkali metal content so as to be ready for re-cycling.

3,716,568

REACTION PRODUCTS OF DIOCTYLTIN OXIDE AND DIOCTYLTIN MONOHYDRIC ALIPHATIC SATURATED ALCOHOL THIOGLYCOLATE ESTERS AND PROCESS

Lawrence R. Brecker, Brooklyn, and Otto S. Kauder, Jamaica, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 788,915, Jan. 3, 1969, Pat. No. 3,591,549. This application Sept. 1, 1970, Ser. No. 68,802

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 9 Claims

Dioctyltin oxide-dioctyltin monohydric aliphatic saturated alcohol thioglycolate ester reaction products are provided, which are particularly useful as stabilizers for polyvinyl chloride resins.

3,716,569

SILICON-CONTAINING AMINOMETHYL PHOSPHONATES

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,124

Int. Cl. C07f 7/02, 7/04

U.S. Cl. 260—448.8 N 5 Claims

Silicon-containing aminomethyl, or substituted aminomethyl, phosphonic acids and derivatives thereof. The silicon atom is silicone functional (i.e. has a —SiO— group) and is also attached to an alkyleneamino group which may have one or more amino groups (i.e. an alkyleneamine group having at least one N—H group) capable of reacting with a carbonyl compound (i.e. aldehyde or ketone) and phosphorous acid, or a derivative thereof, to form aminomethyl phosphonic acid. All, or less than all, of the N—H groups may be converted to aminomethyl phosphonic acids. The silicon-aminomethyl phosphonic acids may be monomeric, polymeric, or copolymeric. They are useful, for example, as corrosion inhibitors, scale inhibitors, water clarifiers and for other uses.

3,716,570

NOVEL HYDROGEN CONTAINING FLUOROALKYL HYPOCHLORITES AND PROCESS FOR THE PREPARATION THEREOF

Douglas Eugene Gould, Dover; Lowell Ray Anderson, Parsippany; David Edward Young, Denville, and William Burke Fox, Morris Township, Morris County, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 5, 1969, Ser. No. 830,864

Int. Cl. C07c 7/00

U.S. Cl. 260—453 R 13 Claims

Hydrogen containing fluoroalkyl hypochlorites of the formula:

$$R_3COCl$$

wherein each R may be hydrogen, lower alkyl, aryl and fluoroalkyl with the proviso that at least one R substituent is fluoroalkyl and one R substituent contains at least one hydrogen atom. The alkyl and fluoroalkyl moieties may contain the same or a different number of carbon atoms and each may contain up to six carbon (lower alkyl), in a straight, or branched chain structure and when R contains six carbon atoms, it may represent an alicyclic moiety. These novel hydrogen containing fluoroalkyl hypochlorites can be prepared by reacting the corresponding alcohols with chlorine monofluoride (ClF) in the absence of a catalyst. These compounds are useful as polymerization initiators, chlorinating agents, bleaching agents, and are valuable intermediates for the syntheses of other useful compounds.

3,716,571

OLIGOCARBONATE ACRYLATES AND A PROCESS FOR PRODUCING THE SAME

Alfred Anisimovich Berlin; Tamara Yakovlevna Kefeli; Natalia Lvovna Marshavina, all of Moscow; Grigory Mikhailovich Strongin, Dzerzhinsk; Nikolai Vladimirovich Kara-Glaur, Dzerzhinsk; Boris Ivanovich Kolomazov, Dzerzhinsk; Alexei Vasilievich Efimov, Dzerzhinsk; Aglaida Nikolaevna Bodrova, Dzerzhinsk, and Judif Markovna Altshuler, Dzerzhinsk, all of U.S.S.R., assignors to Institut Khimicheskoi Fiziki an SSSR, Moscow, U.S.S.R.

Filed July 2, 1969, Ser. No. 838,648

Int. Cl. C07c 69/54; C08g 17/10, 17/13

U.S. Cl. 260—463 5 Claims

A novel class of polymerizable oligomers -oligocarbonate-acrylates and a process for producing the same by reacting monoesters of alkylene glycols and acids of the acrylic series with bischloroformates of glycols or bisphenols or with oligomeric compounds containing terminal bischloroformate groups.

Said unsaturated oligoesters may be used in compositions of contact binding fiberglass plastics, colorless film-forming materials, electroinsulating compositions, adhesives. Besides, they may be used for producing heat-resistant protecting glass of improved strength, optical components, injection molding plastics and other polymer materials.

3,716,572

ARYL CARBONATES OF POLYOLS

Donald R. Moore, Rutherford, N.J., and Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application July 6, 1966, Ser. No. 563,064, now Patent No. 3,542,841. Divided and this application July 14, 1970, Ser. No. 62,733

Int. Cl. C07c 69/00; C08g 22/04; D06m 15/60

U.S. Cl. 260—463 2 Claims

This invention concerns novel aliphatic polyaryl carbonates useful as intermediates and as crosslinking agents for polyamines and polyimines.

3,716,573

PREPARATION OF AMINO ACID DERIVATIVES

Seemon H. Pives, Murray Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 774,213, Nov. 7, 1968, Pat. No. 3,676,453. This application June 5, 1970, Ser. No. 57,395

Int. Cl. C07c 103/30

U.S. Cl. 260—471 A 8 Claims

Amino acid derivatives are prepared by reacting a 2,4 or 4 substituted-4H-oxazol-5-one with a carboxylic acid halide to form a novel oxazole product which rearranges on heating to the azlactone which is also novel. The rearranged product is reacted with ammonia, an alcohol, a mercaptan or amines to form the corresponding amino acid derivatives which are useful as pharmaceutical intermediates.

3,716,574

PURE CRYSTALLINE PLICATIC ACID TETRAHYDRATE AND THE METHYL ESTER THEREOF

John Howard and Terence D. McIntosh, Vancouver, British Columbia, Canada, assignors to Rayonier Incorporated, New York, N.Y.

No Drawing. Filed Dec. 1, 1967, Ser. No. 687,092

The portion of the term of the patent subsequent to Feb. 22, 1989, has been disclaimed

Int. Cl. C07c 65/14, 69/76

U.S. Cl. 260—473 F 2 Claims

Pure crystalline plicatic acid tetrahydrate that is stable to heat and light up to its melting point of 176° C. is

prepared from substantially pure methyl plicatate. The pure methyl plicatate, which is itself a new composition of matter conveniently prepared from an aqueous extract of red cedar heartwood, is saponified with an aqueous solution of alkali metal hydroxide at an elevated temperature under substantially non-oxidative conditions. The resulting alkali metal plicatate solution is then acidified with a slight excess of a mineral acid such as hydrochloric or sulfuric acid, and the acidified solution is cooled, and if desired seeded, whereupon pure crystalline plicatic acid tetrahydrate precipitates in yields as high as 80 or 90 percent of theoretical.

3,716,575
PURIFICATION OF BIS(2-HYDROXYETHYL)TEREPHTHALATE

Ray N. Finch; John P. Mireur, and Hollye Fouts, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 713,273, March 8, 1968, abandoned. This application Feb. 16, 1971, Ser. No. 115,859

Int. Cl. C07c 69/82

U.S. Cl. 260—475 PR **6 Claims**

A process for the removal of color forming impurities, such as aldehydes and nitrogen compounds, from bis(2-hydroxyethyl terephthalate by treatment with mixtures of an alkali metal sulfite and an alkali metal bisulfite.

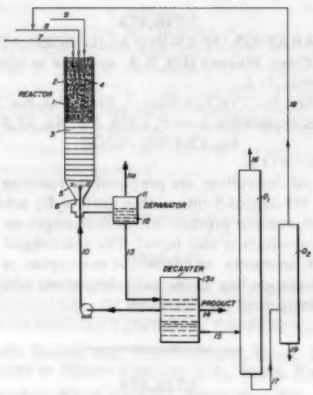
3,716,576
OXIDATIVE DEHYDROGENATION PROCESS FOR PREPARING UNSATURATED ORGANIC COMPOUNDS

Alden E. Blood, and Herschel T. Vinyard, both of P. O. Box 2068, Longview, Tex.

Continuation-in-part of Ser. No. 550,518, May 16, 1966, abandoned. This application July 22, 1969, Ser. No. 847,789

Int. Cl. C07c 69/52; B01d 3/00

U.S. Cl. 260—486 D **7 Claims**



A process for obtaining salt-free aqueous hydrogen iodide from the crude reaction mixture resulting from the oxidative dehydrogenation of organic compounds in the presence of an iodine-containing material. The process comprises separating the organic product from the crude reaction mixture and distilling in two stages the aqueous layer containing hydrogen iodide to obtain an aqueous composition consisting essentially of hydrogen iodide. The aqueous hydrogen iodide composition is recycled to the reaction zone. The process is particularly useful in those oxidative dehydrogenation processes wherein hydrogen iodide hydrate is employed as a catalyst.

3,716,577
PREPARATION OF FLUORINATED ESTERS

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

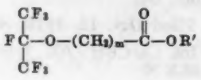
Division of Ser. No. 841,616, July 14, 1969, Pat. No. 3,674,820, which is a division of Ser. No. 703,199, Nov. 22, 1967, Pat. No. 3,527,742, which is a division of Ser. No. 477,331, Aug. 4, 1965, Pat. No. 3,424,785.

Filed July 30, 1971, Ser. No. 167,812

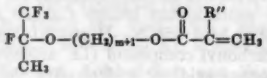
Int. Cl. C07c 69/54

U.S. Cl. 260—486 H **4 Claims**

Fluorinated ketones are converted into acrylic esters, using the following typical plan: Hexafluoroacetone is reacted with an alkali metal fluoride, and the resulting intermediate is reacted with an omega-halo-aliphatic carboxylic acid ester, yielding an ester of the structure



wherein m is 1–20, R′ is a hydrocarbon group. This ester is reduced to produce an alcohol which is reacted with acryloyl (or methacryloyl) chloride, yielding the product



wherein m is 1–20, R″ is H or CH_3.

3,716,578
HEXAHYDROPHENANTHRENE DERIVATIVES

Poul Johnk, Vaerlose, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark

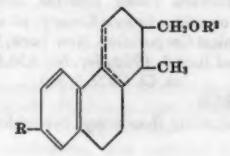
Filed March 18, 1970, Ser. No. 20,819

Claims priority, application Great Britain, April 3, 1969, 17,637/69

Int. Cl. C07c 69/02

U.S. Cl. 260—488 CD **3 Claims**

Novel hexahydrophenanthrene derivatives of the general formula



(I)

in which R is hydrogen or OR^1; R^1 is hydrogen, benzyl, lower alkyl or cycloalkyl; R^2 is hydrogen, lower alkyl, cycloalkyl, cycloalkyl containing a hetero atom, or OCR^2; R^3 is hydrogen, lower alkyl or CH_2SO_2X; X is chlorine, OR^4,

or OMe; R^4 is hydrogen or lower alkyl; R^5 and R^6 are hydrogen or lower alkyl, or R^5 and R^6 together with the attached N-atom form a heterocyclic ring; and Me is an alkali metal or an earth alkali metal atom, useful anti-fertility compositions for oral administration, as well as processes for their production.

3,716,579

ESTER DERIVATIVES OF PLEUROMUTILIN

Franz Knauseder, and Ernst Brandl, both of Tirol, Austria, assignors to Biochemie Gesellschaft m.b.H., Vienna, Austria

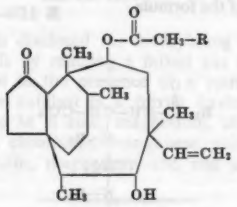
Filed July 20, 1970, Ser. No. 56,752

Claims priority, application Austria, July 21, 1969, A 7004/69

Int. Cl. C07c *69/16*; C12d *9/22*

U.S. Cl. 260—488 B 2 Claims

The invention concerns new pleuromutilin derivatives of the formula:



wherein R is $CH_3-(CH_2)_7-CH=CH-(CH_2)_7-COO-$, $CH_3-(CH_2)_4-CH=CH-CH_2-CH=CH-(CH_2)_7-COO-$, $CH_3-(CH_2)_9-CH=CH-(CH_2)_7-COO-$, or hydrogen.

The derivatives are useful animal feed additives, and also find application in veterinary medicine.

3,716,580

FUNCTIONAL TERTIARY PHOSPHINE OXIDES

Ludwig Maier, Kilchberg/Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

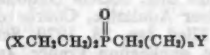
Continuation-in-part of Ser. No. 883,291, Dec. 8, 1969, abandoned. This application Dec. 3, 1970. Ser. No. 94,965

Claims priority, application Switzerland, Dec. 17, 1968, 19115/68; Aug. 28, 1969, 13191/69; Dec. 11, 1969, 18556/69

Int. Cl. C07f *9/02*

U.S. Cl. 260—488 J 13 Claims

Tertiary phosphine oxides of the formula



in which X is selected from the group consisting of hydroxyl, chlorine, bromine or an RO, RS or RC(O)O— group, wherein R is a hydrocarbon group, Y signifies hydroxyl, chlorine or bromine if *n* is O, or Y is defined as X if *n* is 1, and *n* is 0 or 1, and a novel process for preparing such phosphine oxides. Tertiary phosphine oxides, exemplified by tris-(2-hydroxyethyl)-phosphine oxide, bis-(2-chloroethyl)-chloromethylphosphine oxide and bis-(2-decanoxyethyl)-chloromethylphosphine oxide are useful as flameproofing agents and plasticizers.

3,716,581

PROCESS FOR PREPARING OLEFIN ESTERS

Benedetto Calcagno, and Marcello Ghirga, both of Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed April 22, 1968, Ser. No. 723,255

Claims priority, application Italy, April 29, 1967, 15535 A/67

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 13 Claims

A process for preparing unsatured esters from olefines and carboxylic acids is provided, in which the catalytic salts are regenerated by chlorine treatment and returned to the reaction.

3,716,582

SULFOPHENYLINDAN DICARBOXYLIC ACID AND DERIVATIVES THEREOF

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 794,415, Jan. 27, 1969, Pat. No. 3,554,975. This application Aug. 6, 1970, Ser. No. 61,787

Int. Cl. C07c *143/52*

U.S. Cl. 200—507 R 3 Claims

The invention relates to sulfophenylindan dicarboxylic acids, salts and esters thereof and to polyester resins containing units of these materials. The polyester resins have improved dye receptivity.

3,716,583

PHENOXY CARBOXYLIC ACID DERIVATIVE

Yasushi Nakamura, Ibaragi; Kunio Agatsuma; Yoshihiro Tanaka, both of Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

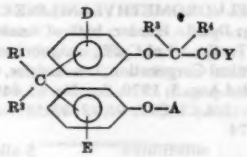
Filed April 7, 1970, Ser. No. 26,412

Claims priority, application Japan, April 16, 1969, 44/29905; April 16, 1969, 44/29907; May 2, 1969, 44/34166; May 2, 1969, 44/34167; Oct. 3, 1969, 44/80041; Oct. 3, 1969, 44/80042; Dec. 19, 1969, 44/102809; Dec. 23, 1969, 44/104194

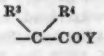
Int. Cl. C07c *69/76*

U.S. Cl. 260—520 7 Claims

Novel anti-atherosclerosis agents having the formula,

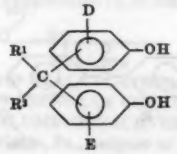


wherein typical examples of R^1 and R^2 are hydrogen, C_1—C_8 alkyl, phenyl, benzyl and phenethyl, or R^1 and R^2 may form cycloalkylidene together with a carbon atom bonded therewith; R^3 and R^4 each is hydrogen or C_1—C_4 alkyl; Y is hydroxyl, C_1—C_4 alkoxy, phenoxy or an amine residue; A is hydrogen or a group of the formula,



wherein R^3, R^4 and Y have the same meanings as defined above; and D and E each is hydrogen or halogen.

These compounds are produced, for example, by reacting a bisphenolic compound of the formula,

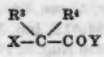


with chloroform and a ketone compound of the formula,

$$R^3-CO-R^4$$

in the presence of an alkali. Alternatively, they are produced

by reacting the bisphenolic compound with α-halogeno- or α-hydroxycarboxylic acid derivative of the formula,



wherein R^1, R^2, R^3, R^4, D, E and Y have the same meanings as defined above; and X is halogen or hydroxyl.

3,716,584

PROCESS FOR THE PURIFICATION OF LACTIC ACID

Gerard Chaintron, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 21, 1970, Ser. No. 39,567

Claims priority, application France, May 23, 1969, 6916915

Int. Cl. C07c *59/08*

U.S. Cl. 260—535 R **7 Claims**

This invention provides a process for purifying lactic acid obtained by hydrolysis of the intermediate products produced by the oxidation of propylene with nitric acid and/or nitrogen peroxide, with removal of some, at least, of the nitric acid, by treating the lactic acid with hydrogen in the presence of a hydrogenation catalyst.

3,716,585

ALKOXY TRIFLUOROMETHYLANILINE COMPOUNDS

Philip L. Strong; Don L. Hunter, both of Anaheim, and Cecil W. LeFevre, Tustin, all of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Aug. 5, 1970, Ser. No. 61,449

Int. Cl. C07c *91/42, 87/58*

U.S. Cl. 260—574 **6 Claims**

N-alkyl substituted 5-alkoxy-2-nitro-4-trifluoromethylanilines and their thio analogues. The compounds are useful as herbicides and can be formulated with conventional herbicide carriers.

3,716,586

NEW 2-HYDROXY-3,5-DI-(TERT. BUTYL)-BENZOPHENONES

Kurt Hofer, Munchenstein/BL, and Rudolf Kessler, Reinach/BL, both of Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basle, Switzerland

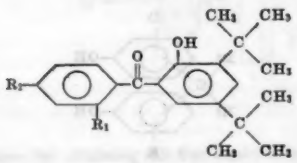
Filed July 16, 1970, Ser. No. 55,604

Claims priority, application Switzerland, July 25, 1969, 11367/69

Int. Cl. C07c *49/82*

U.S. Cl. 260—591 **7 Claims**

New 2-Hydroxy-3,5-di-(tert. butyl)-benzophenones of Formula



(I)

wherein R_1 stands for hydrogen or lower alkyl and R_2 for hydrogen or alkyl or for phenyl, phenoxy or phenylmercapto which may be substituted by alkyl, chlorine or bromine are prepared by a Friedel-Crafts condensation reaction and are useful as ultraviolet absorbers.

3,716,587

N-(PHENYL OR BENZYL)-N,N'-BIS-(1-AMINO-2,2,2-TRICHLORO)-ETHYL)ALKYLENIAMINES

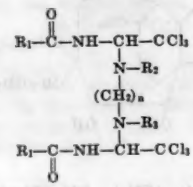
Walter Ost; Klaus Thomas, Dietrich Jerchel, all of Ingelheim/Rhine and Karl-Richard Appel, Biberach-Rissegg, all of Germany, assignors to C. H. Boehringer Sohn, Ingelheim/Rhine, Germany

Continuation-in-part of Ser. No. 793,187, Jan. 22, 1969, Pat. No. 3,595,916. This application March 25, 1971, Ser. No. 128,168

Int. Cl. C07c *103/30*

U.S. Cl. 260—562 P **20 Claims**

Compounds of the formula



wherein

R_1 is hydrogen, alkyl of one to four carbon atoms or trichloromethyl,

R_2 is phenyl, benzyl, chlorophenyl, dichlorophenyl, chlorobenzyl, dichlorobenzyl, bromophenyl or dibromophenyl,

R_3 is hydrogen, phenyl, benzyl or dichlorophenyl, bromophenyl or dibromophenyl, and

n is 1, 2 or 3;

the compounds are useful as fungicides.

3,716,588

MERCAPTO-METHYL SULPHIDES

Christian Esclamadon, Billere, Yves Labat, Pau, and Jean-Baptiste Signouret, Billere, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Tour Aquitaine, Courbevoie, France

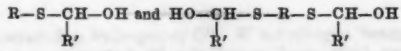
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,587

Claims priority, application France, Jan. 31, 1969, 6902062

Int. Cl. C07c *149/10*

U.S. Cl. 260—609 R **8 Claims**

A process for the preparation of mercapto-methyl sulphides, the sulphide functions of which are in the α-position relatively to the terminal thiol functions, comprises causing a mercaptan RSH or a dimercaptan HS—R—SH to react with an aldehyde R'CHO, and sulphurising with H_2S the herimercaptal or dihemimercaptal



compound thus obtained, wherein R is a hydrocarbon group having from 1 to 12 carbon atoms; it can be an alkyl, cycloalkyl or aryl group, which may comprise thioether or ether groups or any other functional group which does not react with H_2S; R' can be hydrogen, a saturated or unsaturated alkyl radical, a saturated or unsaturated cycloalkyl radical or an aryl radical.

New mercapto-methyl sulphides are thus obtained.

The invention includes processes for plasticising sulphur with these new thiols, and, as new industrial products, plastic sulphur compositions.

3,716,589

PROCESS FOR THE SYNTHESIS OF 2,6-DIMETHYLPHENOLS

Takeshi Kotanigawa, Mitsuyoshi Yamamoto, and Katsuyoshi Shimokawa, Sapporo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,263

Claims priority, application Japan, Nov. 27, 1968, 43/87,569

Int. Cl. C07c *37/16*

U.S. Cl. 260—621 R 6 Claims

A process is disclosed for methylating the ortho-position of phenols by reacting a mixed gas of phenols and methyl alcohol in the presence of a composite catalyst. The composite catalyst is a ferrite having the formula MFe_2O_4 where M is zinc, magnesium, calcium, barium, cobalt, nickel, chromium, manganese, cadmium, copper, silver, copper-zinc, magnesium-zinc, and silver-zinc.

3,716,590

PROCESS FOR PREPARING THE P,P-DINITROBIBENZYL

Dr. Eng. Adrian Caraculacu; Eng. Alla Petrus, both of Iasi, and Eng. Mircea Laba, Ploiesti, all of Romania, assignors to Institutul De Chimie Macromolecular Petre Poni-Iasi, Iasi, Romania

Filed March 24, 1971, Ser. No. 127,815

Int. Cl. C07c *79/10*; B01j *1/12*

U.S. Cl. 260—645 6 Claims

p,p'-dinitrobibenzyl is produced by oxidizing p-nitrotoluene alone or in admixture with o-nitrotoluene in a pulsed column with air or oxygen in the presence of alcoholic alkali.

3,716,591

OLEFIN HALOGENATION

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,067

Int. Cl. C07c *17/02, 19/02, 23/00*

U.S. Cl. 260—648 R 10 Claims

Halogenated olefinic compounds are formed by reacting an olefinic compound with a halogen in the presence of a non-polar diluent, a Lewis acid, and only a complex forming amount of a polar organic compound, the halogenated product being useful as a flame retardant in polyolefins.

3,716,592

PROCESS FOR THE PREPARATION OF ALKYL, PERFLUOROALKYL AND ARYL IODIDES

Leonard S. Silbert, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Mar. 23, 1970, Ser. No. 24,923, now Patent No. 3,652,682. Divided and this application Nov. 12, 1971, Ser. No. 198,444

Int. Cl. C07c *25/04*

U.S. Cl. 260—650 R 1 Claim

High yields of alkyl, perfluoroalkyl and aryl iodides are prepared directly from their corresponding carboxylic acids by reaction in solution with iodine and aroyl peroxide or t-butylperoxy isopropyl carbonate. The reaction is conducted at a temperature of about 110–125° C. for about two to three hours in solvents such as 1,3-dichloropropane, 1,3-dibromopropane and 1,1,2,2-tetrachlorodifluorethane. Solvents such as 1,2-dichloroethane and carbon tetrachloride can be used as solvents but they require longer reaction times.

3,716,593

HYDROGEN FLUORIDE RECOVERY METHOD

Tom Hutson, Jr., and Cecil O. Carter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed June 22, 1970, Ser. No. 48,342

Int. Cl. C07c *17/08*

U.S. Cl. 260—653.6 6 Claims

A hydrogen fluoride and acid soluble oil mixture is contacted with water, the oil separated therefrom, then reacted with an olefin and the resultant organic fluorides are recovered.

3,716,594

PROCESS FOR THE PRODUCTION OF LIVING OLIGOMER

Yutaka Hoshino; Koshiro Matsukawa; Akira Nadaka, and Kazuo Uno, all of Niigata, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed March 25, 1970, Ser. No. 22,489

Claims priority, application Japan, April 1, 1969, 44/24412

Int. Cl. C07f *1/04*

U.S. Cl. 260—665 R 4 Claims

In the process for producing alkali metal dianion complex dimer (disodiooctadiene) and metal dianion complex oligomer which is an initiator for living polymerization by reaction between fine particles of sodium metal and 1, 3-butadiene, cohesion of sodium metal particle is avoidable by maintaining the ratio of ME/LE of 2.0 to 0 wherein ME is the molar quantity of metallic sodium (unreacted sodium metal); LE is the equivalent quantity of carbanion complex terminal of disodiooctadiene (sodium corresponding to cation attached to butadiene) and the resulting initiator gives living polymer having narrow polymerization degree and a coincident average polymerization degree with the expected value calculated from the molar ratio of the sodium metal to butadiene.

3,716,595

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J., John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Application Apr. 7, 1967, Ser. No. 635,287, which is a continuation-in-part of abandoned application Ser. No. 499,064, Oct. 20, 1965. Divided and this application Oct. 16, 1970, Ser. No. 81,606

Int. Cl. C07c *13/62*

U.S. Cl. 260—666 PY 1 Claim

Photochromic 1,3,6,8-tetra(lower)alkyl-3,16-dimethyl-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl - 15,16 - methylene-15,16-dihydropyrenes substituted in one or both of the 2- and 7-positions benzoyl, alkanoyl, alkanoyloxy, cyano, nitro, alkyl, α-hydroxyalkyl, α-acyloxyalkyl, α-isonitrosoalkyl, or acylamido groups are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-acetamido-7-nitro-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene.

3,716,596

ALKYLATION AND DEALKYLATION OF AROMATICS IN THE PRESENCE OF CRYSTALLINE ALUMINOSILICATES

Emmerson Bowes, Media, Pa., assignor to Mobil Oil Corporation

Filed April 18, 1968, Ser. No. 722,206

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 C 4 Claims

A process for alkylating or dealkylating a compound capable of alkylation or dealkylation by contacting it in a reaction zone maintained under conditions effective for accomplishing said alkylation or dealkylation with a catalyst comprising a

crystalline zeolite characterized by a unique X-ray diffraction pattern or products of thermal treatment of the zeolite. The zeolite can be further defined by reference to the following formula expressed in terms of mole ratios of oxides:

$$M_{2/n}O:J_2O_3:3\text{-}20ZO_2:0\text{-}20H_2O$$

wherein M is a cation, J is aluminum or gallium and Z is silicon or germanium and *n* is the valence of M.

3,716,597

PROCESS FOR ALKYLATING AROMATIC HYDROCARBONS

Roy T. Mitsche, Island Lake, and Edward Michalko, Lombard, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 20,024, March 16, 1970, Pat. No. 3,677,973. This application Dec. 28, 1970, Ser. No. 102,058

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 C **11 Claims**

A process for alkylating alkylatable aromatic hydrocarbons using a catalyst comprising a zeolite with a mordenite crystal structure containing alumina fixed in combination therewith.

3,716,598

HARDENABLE EPOXY RESIN COMPOSITIONS

Mark Markovitz, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 28, 1971, Ser. No. 193,550

Int. Cl. C08g *45/08*

U.S. Cl. 260—831 **6 Claims**

The cure rate of 1,2-epoxy resins containing more than one epoxy group per molecule can be controlled over a wide range of times by a catalytic hardener comprising from 0.05 to 10 percent based on the weight of the epoxy resin of a bis(triorganotin) oxide and from 0.1 to 15 percent by weight of the epoxy resin of a phenolic accelerator.

3,716,599

ACRYLIC FLUOROCARBON COATING COMPOSITIONS

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 77,310, Oct. 1, 1970. This application Oct. 20, 1971, Ser. No. 191,056

Int. Cl. C08g *41/04*

U.S. Cl. 260—859 **11 Claims**

Converting coating compositions containing polyvinyl fluoride or polyvinylidene fluoride and a cross-linkable amino acrylic polymer and a blocked isocyanate.

3,716,600

N-ACYL DERIVATIVES OF PHOSPHOROAMIDOTHIOATES

Philip S. Magee, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 810,383, March 25, 1969, abandoned. This application Feb. 24, 1970, Ser. No. 13,846

Int. Cl. C07f *9/24*; A01n *9/36*

U.S. Cl. 260—959 **12 Claims**

N-acyl derivatives of O-alkyl-S-aliphatic hydrocarbyl phosphoroamidothioates and S-alkyl-S-aliphatic hydrocarbyl phosphoroamidothioates. These compounds are insecticidal.

3,716,601

POLY(ETHER ESTERS) OF PHTHALIC ACID SALTS AND DI(HALOALKYL) ETHERS AS DYE RECEPTIVE AGENTS

Donnie G. Brady; Harold R. Deck; Faber B. Jones, all of Bartlesville, Okla., and John H. Underwood, Charlotte, N.C., assignors to Phillips Petroleum Company

Filed June 16, 1971, Ser. No. 153,866

Int. Cl. C08g *39/10*; D06p *3/00*

U.S. Cl. 260—873 **6 Claims**

Poly(ether esters) are prepared by reacting a phthalic acid salt with a di(haloalkyl)ether in a polar solvent using a phosphonium salt catalyst. The resulting poly(ether esters) are useful in olefin polymers to improve dye receptivity.

3,716,602

HEAT RESISTANT ELASTOMER COMPOSITIONS

Ichiro Iwami, Tsutomu Matsunaga, Sakae Inouye, Makoto Fujimori, Noriyuki Hayashi, Norio Wada, Ken Yoneyama, and Hideaki Inaba, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Dec. 12, 1969, Ser. No. 884,748

Claims priority, application Japan, Dec. 17, 1968, 43/92,046

Int. Cl. C08c *11/60*; C08d *5/04*; C08f *15/40*

U.S. Cl. 260—889 **4 Claims**

Heat resistant elastomer compositions are obtained by adding to a cross-linkable elastomer composition containing at least 5% by weight of an elastomer containing an active halogen in the molecule, phenothiazine or the derivatives thereof.

3,716,603

TRIS(3,5-DIHYDROCARBYL-4-HYDROXY PHENYL)PHOSPHATES

Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1965, Ser. No. 505,982

Int. Cl. C07f *9/12*; C08k *1/60*; C10l *1/26*

U.S. Cl. 260—953 **7 Claims**

Organic material is stabilized by the addition of a tris-(3,5 - dihydrocarbyl-4-hydroxyphenyl)phosphate, either alone or in combination with a dialkylthiodialkanoate.

This invention relates to new 3,5-dihydrocarbyl-4-hydroxyphenyl phosphates and their use as antioxidants.

Most organic materials undergo degradation in the presence of oxygen. This degradation is accelerated at increased temperatures. Frequently, high temperatures are encountered during the processing of these materials in manufacturing operations and thus some form of stabilizer is required for many materials, even during the manufacturing stage. Other materials are not subject to extremes in temperature during manufacture, but even these undergo degradation on aging.

3,716,604

METHOD FOR BONDING SOLID PROPELLANTS TO ROCKET MOTOR CASING

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed May 2, 1967, Ser. No. 637,037

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 R **4 Claims**

The reliability of propellant-case bond adhesion is improved by chemically bonding the propellant binder to the insulator of the rocket motor casing during the propellant cure cycle. Bonding is effected by treating a surface of an uncured elastomeric insulator with a polyfunctional material such as unsaturated alcohols, acids, amines, or isocyanates, curing the insulator, placing uncured propellant against the treated surface, and then curing the propellant in place. Excellent adhesion of nitrocellulose-containing propellants to butadiene-styrene type insulators is demonstrated using undecylenic alcohol as the surface treating material.

3,716,605
PRECIPITATION PROCESSES FOR METAL-CONTAINING MATERIALS

John Herbert Grimes, Basingstoke, and William Dress, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 26, 1970, Ser. No. 5,964

Claims priority, application Great Britain, Jan. 31, 1969, 5,500/69

Int. Cl. B01j *13/00;* **C01g** *57/00;* **G21c** *21/00*

U.S. Cl. 264—0.5 **14 Claims**

To a solution of a soluble salt of the relevant material or metals, e.g., iron, thorium, uranium, or aluminum, is added a polymeric organic compound, eg a polysaccharide such as dextran or carob gum, which renders the solution viscous and forms a complex with the metallic ions. The viscous solution is formed into a suitable physical configuration, eg drops, and contacted with a gaseous reagent to precipitate the metal or metals as insoluble compounds, eg iron can be precipitated by contacting with ammonia gas. The gaseous reagent employed moves relative to the viscous solution in said form of a suitable physical configuration. The organic compound may be driven off by heating and the precipitate reduced to metal if desired.

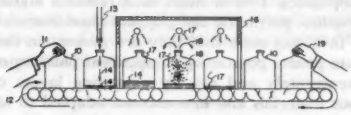
3,716,606
METHOD OF STABILIZING THERMO-PLASTIC CONTAINERS

Patrick Seymour Bazett, London, Ontario, Canada, assignor to Kemp Products Limited, Ontario, Canada

Filed July 15, 1970, Ser. No. 55,001

Int. Cl. B29d *23/00*

U.S. Cl. 264—25 **7 Claims**



Thermoplastic containers, particularly polyethylene, can be stabilized with desired or required control limit on volume and shape, such that they are capable of being used at temperature ranges in excess of 110°F. without appreciable or significant loss of shape or capacity. This is achieved by placing a small amount of liquid such as water within the bottle and subjecting the bottle to a microwave radiant energy field such that the liquid (water) absorbs the radiant energy and boils off into steam. The vapor generated would appear to be converted (after all water has evaporated) into superheated vapor which scours the interior of the bottle causing it to shrink and to stabilize such that under subsequent elevated heat environments (service temperatures) it is essentially stable in volume and shape.

3,716,607
HEAT TREATMENT OF MOLTEN CARBONACEOUS MATERIAL PRIOR TO ITS CONVERSION TO CARBON FIBERS AND OTHER SHAPES

Sugio Otani, Hishi-machi, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 7, 1970, Ser. No. 51,817

Claims priority, application Japan, Nov. 1, 1963, 38/58932; Sept. 1, 1964, 39/49772

Int. Cl. C01b *31/07;* **D06m** *11/12, 11/04*

U.S. Cl. 264—29 **8 Claims**

A method is provided for the production of carbon shaped articles in the form of filaments, yarns, ribbons, films, sheets, tubes and the like. The shaped articles resulting from the process are likewise provided. The method comprises the steps of

a. heating a natural or synthetic organic substance, such as polyvinyl chloride, polyacrylonitrile, petroleum pitch, coal pitch and others, in the presence of an inert gas to a temperature in the range of about 300° to 500° C., which temperature is below the carbonization temperature of such substance,
b. bringing the temperature of the substance to a temperature below the carbonization temperature in an inert atmosphere and forming the substance into a desired shape,
c. contacting the shaped article with an oxidizing gas, and
d. subjecting the article to carbonization by heating in an inert atmosphere at a temperature substantially above 500° C.

The shaped articles are useful for a wide range of uses, as for example, thermal insulation materials, carbon electrodes, and the like.

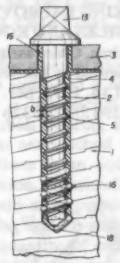
3,716,608
METHOD FOR RESTORING RAILWAY TIES

Gunter Neumann, 106 Theresienfeld, Austria, assignor to Gunter Neumann Terrasan-Erzeugnisse, Theresienfeld, Austria

Filed Feb. 12, 1971, Ser. No. 114,838

Int. Cl. B32b *35/00;* **E01b** *31/24. 31/26*

U.S. Cl. 264—36 **9 Claims**



Railway ties are restored while remaining in the railway bed and without removing the rails nor the bed plates which support the rails. After removing the spikes, the holes in the ties are bored-out by a drill passing smoothly through the spike holes in the bed plates. Metallic inserts, either a rod bent into a double U-shape or shaped into a helix are then placed in the bored-out holes and a filling of a hardening synthetic resin plastic is poured into the holes. The bed plates are raised somewhat from the ties and supported each by at least two spacing strips to form a narrow gap between the lower face of the bed plates and the top faces of the ties and then spikes are driven into the resin-filled holes, whereby the hardening synthetic resin plastic displaced by the spikes fills the gap between the bed plates and the railway ties.

3,716,609
PROCESS FOR PREPARING MOLDED STRUCTURE FROM POLYPHENYLENE SULFIDE RESIN AND FILLER

John C. Trocciola, Glastonbury, Warren L. Luoma, Wethersfield, Richard C. Nickols, Jr., South Windsor, and Roger C. Emanuelson, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

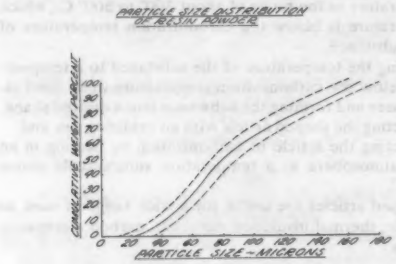
Filed Oct. 5, 1970, Ser. No. 77,928

Int. Cl. B22f *3/14;* **B29c** *25/00;* **C08g** *25/00*

U.S. Cl. 264—111 **5 Claims**

A novel molded structure of polyphenylene sulfide resin and a filler is produced according to a process wherein

the resin/filler mixture is precured by heating the mixture to a temperature below the melting temperature of the resin prior to molding; the mold is preheated to a temperature of about 600 to 700° F. and the charge of resin/filler mixture is preheated to a temperature below



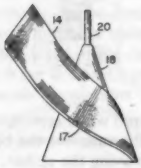
the melting temperature of the resin; the molding pressure of about 3000 p.s.i. is applied to the mold before the resin has time to encapsulate the filler; after cooling the mold while maintaining the pressure, the molded structure is removed from the mold.

3,716,610

METHOD OF MAKING IMPROVED NOSE CAPS FOR MISSILES AND ROCKETS

Max Goldstein, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Army

Filed April 14, 1971, Ser. No. 133,921
Int. Cl. B29d *3/02*; B32b *1/10, 31/18*
U.S. Cl. 264—152 **5 Claims**



A method of making missile nose caps for extremely high temperature performance is disclosed. The method utilizes a typical material such as reinforcement fibers of silica or glass fiber tape inpregnated with a phenolic resin to form a panel. The panel which provides the proper orientation of the reinforcement fibers from a shingle angle to a perpendicular angle is shaped to a preform. The preform is placed in a mold and molded to a final shape and dimension required for the nose cap. If a rosette or rod tip is required, the tip is molded integrally with the nose cap.

3,716,611

METHOD FOR PRODUCING HIGH TENACITY NYLON-66 FILAMENTS

Richard D. Chapman, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 753,877, Aug. 20, 1968, abandoned. This application Nov. 4, 1970, Ser. No. 87,004
Int. Cl. B29c *17/02, 25/00*
U.S. Cl. 264—290 N **1 Claim**

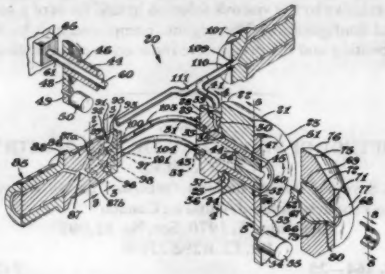
Synthetic filaments having a tenacity of at least 10 grams per denier are produced by storing same for at least 1 day after molecular orientation thereof under high tensile stress and in an area of low relative humidity. The yarn is made preferably from high viscosity nylon-66 polymer. In practice the drawn yarn is wound on a core at 1.0 to 1.8 gpd, stored for 1 to 10 days in air at 15°-40°C and 10–40 percent relative humidity, and then rewound under a tension of 0.12 to 1.0 gpd. Moisture on yarn during storing is 1.1 to 2.3 percent.

3,716,612

METHOD FOR THE FORMATION OF COMPOSITE PLASTIC BODIES

Walter J. Schrenk, Bay City; Kenneth J. Cleereman, Midland; Douglas S. Chisholm, Midland, and Turner Alfrey, Jr., Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 636,480, May 5, 1967, abandoned. This application Jan. 6, 1970, Ser. No. 987
Int. Cl. B29f *1/12, 3/10, 3/12*
U.S. Cl. 264—241 **8 Claims**



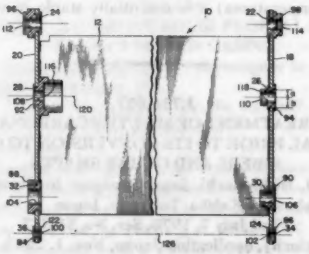
A method is described for making articles of plastic materials; for example, plastic bottles, from a composite of synthetic thermoplastics. Two or more such resinous materials, which have distinct polymeric and physical characteristics, are combined in a way such that they are present in the article in separate phases possessing an apparent plurality of generally commensurately and spirally extending layers of the said resinous materials and in a manner adapted to take full advantage of the resulting combination of properties.

3,716,613

METHOD OF PROVIDING AXIALLY ALIGNED MOLDED PARTS IN NON-ALIGNED APERTURED WALLS OF A PREFORMED MEMBER

William J. Lux, Holland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1970, Ser. No. 84,983
Int. Cl. B29f *1/00*
U.S. Cl. 264—254 **6 Claims**



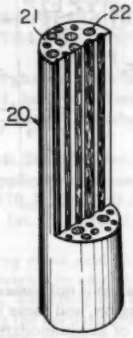
Method of manufacturing is presented which provides axially aligned finished molded parts, such as bushings and/or protuberances in non-aligned apertured wall portions of a preformed member, such as in the non-aligned opposing walls of a U-shaped chart-drive frame.

3,716,614

PROCESS OF MANUFACTURING COLLAGEN FIBER-LIKE SYNTHETIC SUPERFINE FILAMENT BUNDLES

Miyoshi Okamoto, Takatsuki-shi, Osaka; Shunji Mizuguchi, and Koji Watanabe, both of Otsu-shi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 4, 1970, Ser. No. 34,458
Claims priority, application Japan, May 12, 1969, 44/35780
Int. Cl. B29c 25/00
U.S. Cl. 264—344 10 Claims



Collagen fiber-like synthetic superfine filament bundles are prepared through a process in which an "islands-in-a-sea" type composite filament is formed from a sea constituent polymeric material and an island constituent polymeric composition consisting of at least two polymers different from each other, at least one of which has a content of 7 to 93 percent based on the composition, the sea constituent is removed for obtaining a bundle of island constituent superfine filaments and then at least one polymer in the resultant superfine filaments is removed in order to obtain the collagen fiber-like synthetic superfine filament bundles.

ERRATUM

For Class 423—49 see:
Patent No. 3,715,764

3,716,615

PROCESS FOR THE PRODUCTION OF CUPROUS OXIDE

Donald J. Bauer; Philip R. Haskett, and Roald E. Lindstrom, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior

Filed Aug. 24, 1971, Ser. No. 174,541
Int. Cl. C01g 3/02; C22b 3/00
U.S. Cl. 423—35 11 Claims

Cu_2O is precipitated from a copper chelate solution by the addition of alkaline material and a reductant. The stability constant of the chelate must be more than 5.

3,716,616

PROCESS FOR DECONTAMINATION OF NEUTRON-IRRADIATED BERYLLIUM

Kuang-Hui Lin, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 24, 1971, Ser. No. 118,494
Int. Cl. C01f 3/00
U.S. Cl. 423—134 2 Claims

A process for treating neutron-irradiated beryllium containing cobalt-60 is provided which comprises reacting the beryllium with molten stannous chloride under conditions which will produce beryllium chloride and subsequently distilling the beryllium chloride to recover a decontaminated beryllium chloride distillate.

3,716,617

PROCESS FOR PRODUCING ALUMINA

Tsurumi Oku, Niihama, Akio Suzuki, Kobe, and Nobuyoshi Tawara and Kenji Niwa, Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Apr. 13, 1970, Ser. No. 27,475
Claims priority, application Japan, Apr. 17, 1969, 44/30,037
Int. Cl. C01f 7/06
U.S. Cl. 423—121 11 Claims

Improved process for producing alumina according to the Bayer process wherein the digestion residue is separated from the sodium aluminate solution, resulting from the digestion of an alumina-containing ore, by using a synthetic organic high molecular weight flocculant and conducting the separation only when at least 5% by weight of reactive silica remains in the digestion residue. With this process, soda concentrations higher than 70 g./l. may be utilized for digestion.

3,716,618

SEPARATION OF COBALT FROM NICKEL AND COBALT BEARING AMMONIACAL SOLUTIONS

Donald Robert Weir, and Russell Peter Kofluk, both of Fort Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed March 24, 1971, Ser. No. 127,677
Int. Cl. C01g 51/00, 53/00
U.S. Cl. 423—143 7 Claims

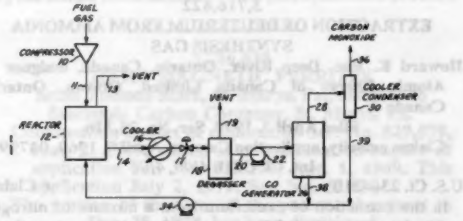
A process for extracting a nickel product having a predetermined nickel to cobalt ratio and a mixed nickel-cobalt sulphide product having a low nickel to cobalt ratio from reduced nickel and cobalt bearing lateritic and garnieritic ores. The reduced ores are leached in one or more stages under oxidizing conditions in an aqueous ammoniacal ammonium carbonate solution. Solution from the leaching operation is treated in a multi-stage cobalt removal operation in which excess sulphidizing agent is added to one stage to effect extraction of a large quantity of cobalt from solution as a mixed nickel-cobalt sulphide precipitate. The amount of sulphidizing agent added to another stage is restricted to produce a mixed nickel-cobalt sulphide precipitate with a low Ni:Co weight ratio. The mixed sulphide precipitate is removed from each stage solution and a portion is recycled to the solution from which it was removed.

3,716,619

PROCESS FOR RECOVERING CARBON MONOXIDE FROM FUEL GAS

James B. Lynn, Bethlehem, and Alan H. Singleton, Emmaus, both of Pa., assignors to Bethlehem Steel Corporation

Filed March 19, 1971, Ser. No. 125,974
Int. Cl. C01b 31/18; C07c 69/06
U.S. Cl. 423—247 6 Claims



Carbon monoxide is recovered from a fuel gas by compressing a fuel gas containing carbon monoxide and by reacting the carbon monoxide with a lower alkyl alcohol to form

alkyl formate. The formate is separated from the fuel gas, and the carbon monoxide is regenerated by decomposition of the formate.

3,716,620

PROCESS FOR REMOVING TRACES OF HYDROGEN SULFIDE AND MERCAPTANS FROM GASES

Andre Deschamps, Chatou; Sigismond Franckowiak, Montesson, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrificants, Rueil Malmaison (Hauts de Seine), France

Filed Oct. 27, 1970, Ser. No. 84,497
Claims priority, application France, Nov. 4, 1969, 6937967
Int. Cl. B01d *53/16*
U.S. Cl. 423—228 **16 Claims**

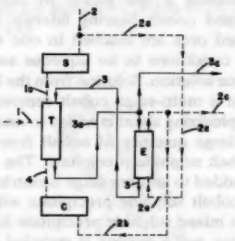
A process for purifying a gas containing hydrogen sulfide or a mercaptan, wherein said gas is contacted with a solution of iodine in an organic solvent, said organic solvent also containing an amine.

3,716,621

DEUTERIUM-HYDROGEN MONOTHERMAL EXCHANGE

Howard Keith Rae, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed April 3, 1970, Ser. No. 25,497
Claims priority, application Canada, April 8, 1969, 047,998
Int. Cl. C01c *1/00*; **C07c** *87/06, 87/14*
U.S. Cl. 23—193 **2 Claims**



A monothermal exchange process of extracting deuterium from ammonia synthesis gas includes passing the gas through an exchange liquid stream consisting of a liquid amine having up to five carbon atoms per molecule to cause deuterium to be transferred from the synthesis gas to the exchange liquid and removing a stream of exchange liquid enriched in deuterium therefrom.

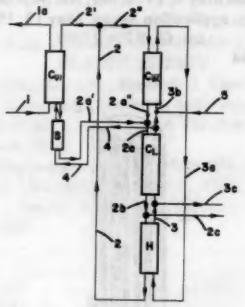
3,716,622

EXTRACTION OF DEUTERIUM FROM AMMONIA SYNTHESIS GAS

Howard K. Rae, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed April 3, 1970, Ser. No. 25,316
Claims priority, application Canada, April 8, 1969, 047999
Int. Cl. C01b *4/00, 4/06*
U.S. Cl. 23—210 **6 Claims**

In the extraction of deuterium from a mixture of nitrogen and hydrogen commercially prepared for subsequent synthesis to ammonia, the synthesis gas is passed through a first cold region in deuterium exchanging relationship with an exchange liquid, said exchange liquid being selected from the group consisting of ammonia, an amine, a mixture of ammonia and an amine and a mixture of amines, and a stream of hydrogen gas is circulated through a second cold region and a hot region in deuterium exchanging relationship with the exchange liquid. Thus the synthesis gas is not passed through the second cold region or the hot region, and these regions do not therefore have to be capable of accommodating so large a flow as the first cold region.

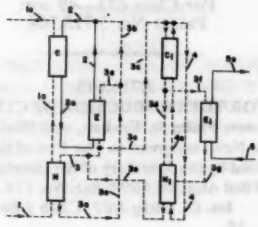


3,716,623

EXTRACTION OF DEUTERIUM FROM HYDROGEN GAS USING AMINES IN A BITHERMAL PROCESS

Allan R. Bancroft, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Apr. 3, 1970, Ser. No. 25,317
Claims priority, application Canada, Apr. 8, 1969, 47,993/69
Int. Cl. C01c *1/00, 87/127*; **C01b** *1/00*
U.S. Cl. 423—248 **12 Claims**



In the extraction of deuterium from hydrogen in a bithermal process for the production of heavy water, a stream containing a first liquid amine with up to five carbon atoms per molecule is used as the exchange liquid in one of the exchange regions, and stream containing a second liquid amine with up to five carbon atoms per molecule or ammonia is used as the exchange liquid in the other exchange region, and deuterium exchange between the two exchange liquid streams is caused to occur under conditions such that countercurrent contact is possible, for example such that one of the exchange liquid exists substantially as a vapour and a portion of the first or second exchange liquid enriched in deuterium is separated after exchange between the two liquids. The amine may be primary aliphatic monoamine or diamines.

3,716,624

NITRONIUM PERCHLORATE STABILIZED BY BF_3

John A. Brown, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Dec. 24, 1964, Ser. No. 421,753
Int. Cl. C01b *11/18*
U.S. Cl. 423—274 4 Claims

1. Nitronium perchlorate stabilized by the presence of an effective stabilizing amount of BF_3.

3,716,625

PROCESS FOR THE PRODUCTION OF NITRIC ACID WITH A CONCENTRATION OF OVER 70 PERCENT BY WEIGHT

Gerhard Oberste-Berghaus, 1 Berlin 39, and Claus-Dieter Karau, 1 Berlin 41, both of Germany, assignors to Bamag Verfahrenstechnik GmbH, Butzbach/Hesson and Berlin, Germany

Filed Feb. 26, 1970, Ser. No. 17,997
Claims priority, application Germany, Feb. 28, 1969, P 19 11 200.6; Jan. 16, 1970, P 20 02 791.2
Int. Cl. C01b *21/40*
U.S. Cl. 23—161 17 Claims

Process of preparing nitric acid (having a concentration of over 70 percent by weight) by catalytically oxidizing ammonia with air to form NO_2, absorbing the NO_2 in water or aqueous nitric acid, increasing the partial pressure of the NO_2 partly by compression and partly by passage through the absorption stage, washing out the residual NO_2 with 60–70 percent nitric acid and recycling the same into the absorption stage, and blowing out the NO_2 through the nitrous gas products of the ammonia oxidation in a degasification stage arranged ahead of the absorption stage.

3,716,626

SEPARATION OF METAL CARBONYL CATALYSTS FROM OXO REACTION MIXTURES

Wilhelm Kniese, Limburgerhof, Hans Juergen Nienburg, Ludwigshafen, Walter Himmele, Walldorf, and Werner Aquila, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 15, 1970, Ser. No. 81,169
Claims priority, application Germany, Oct. 29, 1969, P 19 54 315.8
Int. Cl. C01g *51/02, 55/00;* B01d *15/04*
U.S. Cl. 423—418 6 Claims

An improved process for the separation of metal carbonyl catalysts capable of forming carbonylate anions from oxo reaction mixtures by means of ion exchangers by treating the crude oxo reaction mixture with a basic ion exchanger at a temperature of 0° to 120° C. and pressures ranging from 5 to 700 atmospheres.

3,716,627

PROCESS FOR THE PREPARATION OF VANADIUM CARBIDE

Servaas Middelhoek, Arnhem, Netherlands, assignor to N.V. Hollandse Metallurgische Industrie Billiton, Arnhem, Netherlands

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,886
Claims priority, application Netherlands, Sept. 9, 1969, 6913684
Int. Cl. C01b *31/30;* C22c *29/00*
U.S. Cl. 423—440 13 Claims

A process for the preparation of vanadium carbide from an oxidic, vanadium-containing material which comprises contacting the material at high temperature with a gas containing at least 60 volume percent thereof of at least one low molecular weight hydrocarbon in an amount not exceeding twice the stoichiometric amount. The CO and hydrogen produced as by-products can be used to furnish the heat energy required.

ERRATUM

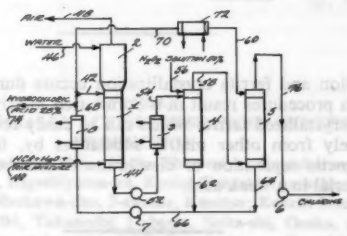
For Class 423—447 see:
Patents Nos. 3,716,331 and 3,716,332

3,716,628

PROCESS FOR THE PRODUCTION OF CHLORINE

Hans Klebe, Alfred Meffert, and Ludwig Lange, Rheinfelden, Baden, Gerhard Fratzer, Ludwigshafen (Rhine), and Franz-Ludwig Dahm, Beuggen, Germany, assignors to Deutsche, Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Nov. 24, 1970, Ser. No. 92,370
Claims priority, application Germany, Dec. 20, 1969, P 19 63 946.4
Int. Cl. C01b *7/04*
U.S. Cl. 423—507 21 Claims



Chlorine is produced from hydrogen chloride containing gas by converting the hydrogen chloride to a 20 to 40 weight percent aqueous solution and reacting the solution with hydrogen peroxide to form chlorine.

3,716,629

PROCESS FOR PREPARING POTASSIUM PEROXYDISULFATE

Russell Alan Miller, Cheektowaga, N.Y., assignor to FMC Corporation, New York, N.Y.

Filed Sept. 10, 1970, Ser. No. 71,271
Int. Cl. C01b *15/08*
U.S. Cl. 423—513 4 Claims

An improvement in a method for preparing potassium peroxydisulfate which comprises adding sodium hydroxide to the potassium peroxydisulfate-potassium sulfate-water mother liquor resulting from the reaction of ammonium peroxydisulfate and potassium sulfate, said addition increasing the sulfate solubility in the mother liquor and substantially reducing the sulfate contamination of the peroxydisulfate product.

3,716,630

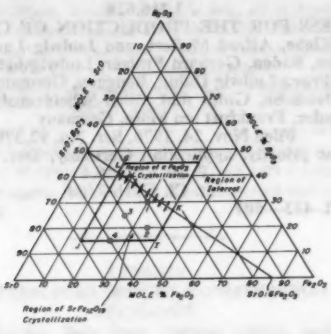
HARD MAGNETIC FERRITES

Brian Thomas Shirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Continuation-in-part of application Ser. No. 829,579, June 2, 1969, which is a continuation-in-part of application Ser. No. 812,158, Apr. 1, 1969. This application July 2, 1970, Ser. No. 51,880
The portion of the term of the patent subsequent to Dec. 28, 1988, has been disclaimed
Int. Cl. C01f *11/00;* C01g *49/00*
U.S. Cl. 423—594 1 Claim

Hard magnetic ferrites of the formula $MO.6Fe_2O_3$ where M is barium, strontium or lead, are made by pro-

viding a molten borate composition containing the metal oxide and ferric oxide in amounts corresponding to the desired ferrite, cooling the melt below the liquidus either so rapidly as to convert the melt to a glass which, upon appropriate heat treatment undergoes nucleation and crystallization of the ferrite, or at a rate slow that devitrification and ferrite crystallization occurs during cooling. Both procedures result in a borate-rich matrix containing the crystallized ferrite which can be easily recovered separately from other matrix substances by, for example, magnetic separation or dissolution of the borate matrix material in a weak acid.



3,716,631

USE OF RADIOACTIVE COMPOUNDS TO DETERMINE FAT ABSORPTION

Jan Frederik Steggerda, Emmasingel, Eindhoven, and Ary Cornelis Houtman, Van Houtenlaan, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New Corporation, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,771
Claims priority, application Netherlands, Feb. 23, 1968, 6802651
Int. Cl. A61k 27/04
U.S. Cl. 424—1 5 Claims

Use of radioactive labeled phenylsubstituted fatty acids to determine disturbances in fat metabolism in animals, the degree of disturbance being determined by measurement of a radioactive degradation product excreted in the urine.

3,716,632

TEST COMPOSITION AND METHOD FOR THE IN VITRO DETERMINATION OF THYROID FUNCTION

Marshall Lloyd Fader, and James Edward Christner, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ill.

Filed April 27, 1970, Ser. No. 32,396
Int. Cl. A61k 27/04
U.S. Cl. 424—1 16 Claims

The thyroid hormone content of blood serum can be readily determined by using an in vitro radioactive thyroid function test system containing a "protein error" pH indicator such as bromcresol purple. Such a "protein error" indicator provides color and detects the presence of the test sample, inhibits the formation of free iodide and decreases the adsorption of radioactive tagged thyroid substance to the walls of the container enclosing same.

3,716,633

VINYL ACETATE-CROTONIC ACID-UNSATURATED ESTER OR ETHER POLYMERS IN HAIR LACQUERS AND SETTING LOTIONS

Andre Viout and Regine Pasero, Paris, France, assignor to Societe Anonyme dite: l'Oreal, Paris, France

No Drawing. Continuation-in-part of applications Ser. No. 530,395, Feb. 8, 1964, and Ser. No. 655,770, July 25, 1967. This application July 25, 1968, Ser. No. 747,470
Claims priority, application France, Mar. 3, 1965, 7,787; Jan. 27, 1966, 47,441; Aug. 3, 1966, 71,998; Luxembourg, July 28, 1967, 54202
The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed
Int. Cl. A61k 7/00
U.S. Cl. 424—47 3 Claims

Copolymers of (a) vinyl acetate, (b) crotonic acid and (c) unsaturated esters or ethers in cosmetic hair treating compositions.

3,716,634

INSECT VIRUS COMPOSITIONS AND PROCESS

Frank E. Wells, Kansas City, Mo., assignor to McLaughlin Gormley King Company, Minneapolis, Minn.

Filed Oct. 19, 1970, Ser. No. 82,083
Int. Cl. C12r 7/00
U.S. Cl. 424—93 7 Claims

Insect polyhedrosis and granulosis virus particles are liberated from their inclusion bodies and then complexed and precipitated from an aqueous dispersion with a basic protein having an isoelectric point above about pH 8.0 to provide a virus concentrate. The resulting precipitate may be dispersed in an oil to provide a stabilized viral insecticide.

3,716,635

ANTIFUNGAL ANTIBIOTIC OBTAINED FROM BASIDIOMYCETE OUDEMANSIELLA MUCIDA AND PROCESS OF MAKING THE SAME

Vladimir Musilek, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Continuation-in-part of applications Ser. No. 600,046, Dec. 8, 1966, and Ser. No. 698,353, Jan. 16, 1968. This application Aug. 4, 1970, Ser. No. 60,903
Claims priority, application Czechoslovakia, Dec. 17, 1965, 7,592/65
Int. Cl. A61k 21/00; C12b 1/00; C12d 9/00
U.S. Cl. 424—122 11 Claims

Antifungal antibiotic obtained by fermentation of a culture of basidiomycete *Oudemansiella mucida* (Schrad. ex. Fr.) Höhn. The antibiotic has the empirical formula $C_{16}H_{18}O_3$, the molecular weight of 258 and a melting point between 51 and 53° C.

3,716,636

ACETIC ACID ANHYDRIDE AS A STABILIZER FOR N-METHYL-N-FORMYL AMIDE OF O,O-DIMETHYL DITHIOPHOSPHORYL ACETIC ACID

Hans Helfenberger, Reinach, Basel-Land, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 767,496, Oct. 14, 1968, which is a continuation-in-part of application Ser. No. 678,450, Oct. 26, 1967, which in turn is a continuation of application Ser. No. 416,596, Dec. 7, 1964, all now abandoned. This application June 25, 1970, Ser. No. 49,942
Claims priority, application Switzerland, Dec. 13, 1963, 15,299/63
Int. Cl. A01n 9/36
U.S. Cl. 424—211 12 Claims

The invention provides liquid anhydrous pesticidal concentrates containing the N-methyl-N-formyl amide of O,O-dimethyldithophosphoryl acetic acid stabilised with an acid anhydride e.g. acetic anhydride.

3,716,637

PHARMACEUTICAL PREPARATIONS

Georg Anner and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Sept. 30, 1970, Ser. No. 77,002
Int. Cl. A61k *17/00*
U.S. Cl. 424—243 7 Claims

A pharmaceutical preparation containing as active substance 3,20-dioxo-6α-methyl-17α-acetoxy-19-nor-Δ^4-pregnene.

3,716,638

6α-METHYL-19-NOR-PROGESTERONE AND A PROCESS OF ITS MANUFACTURE

Georg Anner and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,581
Claims priority, application Switzerland, Oct. 10, 1969, 15,272/69
Int. Cl. A61k *17/00*
U.S. Cl. 424—243 1 Claim

The present invention provides the new 3,20-dioxo-6α-methyl-17α-caproyloxy-19-nor-Δ^4-pregnene.

It may be used as gestagen and for fertility control.

3,716,639

ANOREXIGENIC TETRAHYDROBENZAZEPINES

Karl Hoegerle, Basel, and Ernst Habicht, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 751,381, Aug. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 705,627, Feb. 15, 1968, abandoned. This application March 11, 1970, Ser. No. 23,523
Int. Cl. A61u *27/00*
U.S. Cl. 424—244 6 Claims

7-chloro-2,3,4,5-tetrahydro-1H-3-benzazepines and pharmaceutically acceptable acid addition salts thereof are prepared; therapeutical compositions containing said compounds and methods for producing an anorexigenic effect in a mammal are provided.

3,716,640

10-OXO-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE-5-CARBOXAMIDE IN THE TREATING OF EPILEPSY

Walter Schindler, Riehen, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 16,552, March 4, 1970, Pat. No. 3,642,775. This application Sept. 20, 1971, Ser. No. 182,213
Claims priority, application Switzerland, March 10, 1969, 3583/69
Int. Cl. A61k *27/00*
U.S. Cl. 424—244 2 Claims

10-Oxo-10, 11-dihydro-5H-dibenz[b,f]azepine-5-carboxamide has a depressant effect on the central nervous system; the compound is the active ingredient of pharmaceutical compositions and is useful for the treatment of psychosomatic disturbances, of epilepsy and of trigeminal neuralgia.

3,716,641

COCCIDIOSTAT COMPOSITIONS AND METHODS USING AMINOBENZONITRILES

Philip P. Actor, Phoenixville; Roger C. Parish, King of Prussia, and Vassilios J. Theodorides, West Chester, all of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed July 30, 1970, Ser. No. 59,733
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 24 Claims

p-Aminobenzonitriles are active ingredients for compositions and methods useful for the treatment or prevention of various protozoal infections in animals, especially coccidiosis in poultry. Combinations of p-aminobenzonitriles with other aminopyrimidine anti-protozoal agents such as pyrimethamine give a potentiated activity against *Eimeria tenella*. A particularly active chemical ingredient is p-dimethylaminobenzonitrile and its acid addition salts.

3,716,642

ANTI-INFLAMMATORY, ANTALGIC AND ANTI-PYRETIC MEDICAMENT, ON A PYRIDOXINE FLUFENAMATE BASIS

Raymond Francois Jacques Sarbach; Demetre Yavordios, both of Chatillon-sur-Chaloronne; Le Hao Dong, Montpellier; Jacques Mizoule, Chatillon-sur-Chaloronne, and Charles Ricci, Lyon, all of France, assignors to Institut De Recherche Scientifigue (I.R.S.), Chatillon-sur-Chalorrone, France

Continuation of Ser. No. 58,147, July 24, 1970, Pat. No. 3,627,774. This application Dec. 7, 1971, Ser. No. 205,758
Claims priority, application France, July 24, 1969, 6925288
Int. Cl. A61u *27/00*
U.S. Cl. 424—263 9 Claims

An anti-inflammatory, antalgic and anti-pyretic medicament contains pyridoxine flufenamte and an excipient to which may be added several compatible constituents such as vitamin B_1.

3,716,643

ANTIMICROBIALLY ACTIVE SUBSTANCES AND THEIR PRODUCTION

Toshihiko Kawano, No. 10-9, Shinomiya Kawahara-cho, Yamashina, Higashiyama-ku, Kyoto; Takashi Yamaoka, No. 12, Hishishibukawa-cho, 3-chome, Kusatsu; Keiichi Maruo, No. 2-B6-104, Takanodai 1-chome, Suita-shi, Osaka, and Yasuhisa Furutaka, No. 1-25, Sho 1-chome, Ibaraki-shi, Osaka, all of Japan

Filed May 1, 1970, Ser. No. 33,598
Int. Cl. A01n *9/12*
U.S. Cl. 424—286 20 Claims

Process for preparing antimicrobially active substances which comprises reacting alkylenebis(dithiocarbamic acid) in a salt form with a water-soluble divalent copper salt in the presence of a halogen ion under the condition that more than one molar amount of divalent copper ion to one molar amount of alkylenebis(dithiocarbamate) salt is present in the reaction system and, if desired, under the oxidative condition; optionally followed by subjecting the resulting product to oxidation. The obtained substances are advantageous in showing a stronger antimicrobial activity against a wide variety of phytopathogenic fungi and bacteria than known cupric alkylenebis(dithiocarbamate) does.

3,716,644

HYPOLIPIDEMIC AGENTS

Henry John Albers and Stephen Joseph Riggi, Suffern, N.Y., Frederick Louis Bach, Montvale, N.J., and Elliott Cohen, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 15, 1971, Ser. No. 163,083
Int. Cl. A61k *27/00*
U.S. Cl. 424—308 5 Claims

A method for the lowering of serum lipids in mammals by the administration of meta and para alkoxybenzoic acids, esters and pharmaceutically acceptable salts of said benzoic acids and dimethylaminoethyl esters, wherein the alkoxy group comprises from 12 to 20 carbon atoms; and pharmaceutical compositions thereof.

3,716,645

STABILIZED TRANS-DIETHYL-STILBESTEROL COMPOSITIONS

Werner R. Boehme, Glen Ellyn, and George Vuht, Chicago, both of Ill., assignors to Dawes Laboratories, Inc., Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 4,081
Int. Cl. A61k *27/00*
U.S. Cl. 424—346 19 Claims

A composition of matter containing trans-diethylstilbestrol and from about 0.1 to about 50 percent by weight of a non-toxic acireductone based on the weight of said trans-diethyl-stilbestrol.

3,716,646

BACTERICIDAL COMPOSITION AND METHODS EMPLOYING METHYLENE-2,2'-BIS(4-CHLORO-THYMOL)

Lucien Nouvel, 91 Avenue des Ternes, Paris, France

No Drawing. Filed Mar. 23, 1966, Ser. No. 536,664
Claims priority, application France, Mar. 24, 1965, 10,468
Int. Cl. A61k *27/00*
U.S. Cl. 424—347 11 Claims

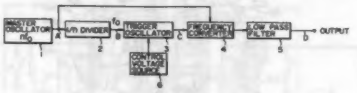
Methylene-2,2'-bis(4-chlorothymol) is employed as a medicinal against gram positive bacteria.

ELECTRICAL

3,716,647
MUSICAL SOUND GENERATING SYSTEM WITH BURST SIGNALS

Akio Kameoka, Kawasaki, and Shinichi Nakamura, Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 8, 1971, Ser. No. 205,866
Claims priority, application Japan, Dec. 10, 1970, 45/109,183; Dec. 11, 1970, 45/109,719
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.11 **11 Claims**

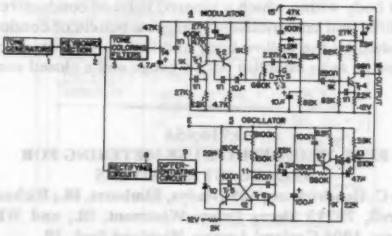


A musical sound generating system for an electronic musical instrument which comprises a master oscillator for producing a signal having a frequency which is integral multiples of a fundamental frequency defining the pitch of a musical sound to be synthesized. The master oscillator output frequency is divided by a frequency divider to obtain a signal of the fundamental frequency. The divider output triggers an oscillator to cause oscillation which is continued during a desired length of time within the period of the fundamental frequency. The trigger oscillator operates at a frequency deviated from the master oscillator frequency by a desired formant frequency associated with the musical sound to be synthesized. The outputs of the master and trigger oscillators are coupled to a frequency converter or amplitude modulator to produce a signal of the formant frequency or difference frequency between master and trigger output frequencies. The output of the frequency converter is then coupled to a low pass filter to produce at the output thereof a burst signal having the instantaneous frequency of the formant frequency. The frequency spectrum envelope of the burst signal has a maximum value at the formant frequency.

3,716,648
ELECTRONIC MUSICAL INSTRUMENTS PROVIDED WITH A CIRCUIT FOR GENERATING A TREMOLO EFFECT

Akihisa Takeyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Oct. 22, 1971, Ser. No. 191,649
Claims priority, application Japan, Oct. 26, 1970, 45/106,303
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 **6 Claims**

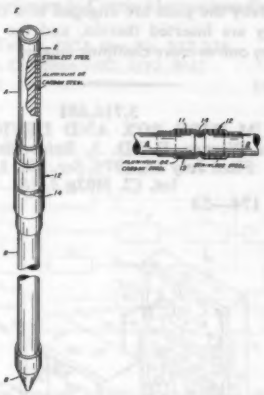


Part of tone signals selectively drawn out of tone generators by operation of a keyboard section is subjected to rectification and differentiation to obtain a trigger signal when the tone signals rise. The trigger signal is supplied to the base of either of first and second transistors jointly constituting an astable multivibrator to trigger it to draw out modulating signals which rise simultaneously with musical tone signals. The modulating signals modulate the musical tone signals in amplitude to obtain a distinct tremolo effect.

3,716,649
GROUNDING ROD AND COUPLER THEREFOR

George A. Smith, Waterbury; Harrison Stevens, Wallingford; Robert R. Walker, Wallingford, and Gilbert D. Boyd, Wallingford, all of Conn., assignors to Allegheny Ludlum Industries, INc., Pittsburgh, Pa.

Filed March 16, 1971, Ser. No. 124,788
Int. Cl. H01r *3/06*
U.S. Cl. 174—7 **21 Claims**



Described herein is an electrical grounding rod comprising a thin-walled tube of a corrosion resistant steel, a conductor tube of aluminum or other suitable electrically conductive material to provide a low resistance path to ground and a core of a plastic-type filler within the inner tube, the core being sufficiently rigid to provide structural support to the thin-walled tube yet resistant enough to allow some bending of the rod to circumvent obstructions encountered in driving the rod into the ground. A driving point is provided to fit over one end of the rod to isolate the aluminum from the earth and to facilitate driving the rod into the ground. In an alternative embodiment an additional steel tube is provided within the conductor tube to form a three-wall or "sandwich" composite.

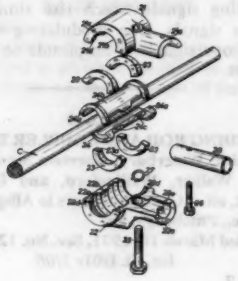
3,716,650
CLAMP WITH RESILIENT GRIPPING UNIT FOR USE WITH OVERHEAD CONDUCTOR SPACERS AND A SPACER INCLUDING THE SAME

Robert de Mecquenem, Chateau de la Roare, Roche la Moliere, France

Filed May 28, 1971, Ser. No. 147,793
Claims priority, application France, May 29, 1970, 7018891
Int. Cl. H02g *7/12, 7/14*
U.S. Cl. 174—42 **8 Claims**

A spacer for overhead conductors is disclosed. The spacer comprises a unit for resiliently gripping directly about the con-

ductor, the unit being constituted essentially by a pair of jaws adapted to be encircled about the conductor and connected one to another by clamping means. Pads of flexible and resilient material are arranged onto half-sheaths made of metal which directly encircles the conductor.



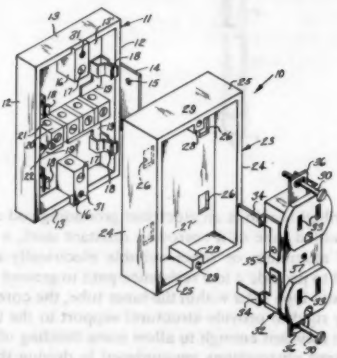
The jaws are provided with recesses having an eccentric bottom surface which differs from the external surface of the pads whereby the pads are engaged in a compression effect when they are inserted therein, and the jaws are brought together by one or more clamping means.

3,716,651

MINIMUM WIRE BOX AND DEVICE ADAPTERS

Ardwin Werner, R.F.D. 3, Batesville, Ind. 47006

Filed July 14, 1971, Ser. No. 162,537
Int. Cl. H02g *3/18*
U.S. Cl. 174—53 **1 Claim**



A plug receiving and switch adaptable device. This device is primarily for the purpose of eliminating the excess wire normally required to make electrical connections to switches, receptacles and the like, and includes a rectangular base with spring clip means received within openings of the outer box shell which receives the plug receptacle or other unit.

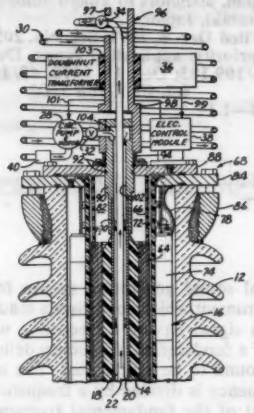
3,716,652

SYSTEM FOR DYNAMICALLY COOLING A HIGH VOLTAGE CABLE TERMINATION

George E. Lusk, Downers Grove, and James H. Nicholas, Flossmoor, both of Ill., assignors to G & W Electric Specialty Company, Blue Island, Ill.

Filed April 18, 1972, Ser. No. 245,211
Int. Cl. H01b *7/28*
U.S. Cl. 174—15 R **19 Claims**

A dynamically cooled high voltage cable termination with a pothead, and a hollow core conductor cable, employs a circulating insulating liquid dielectric through a closed loop system having flow passages within the cable conductor core and a heat exchanger external to the pothead structure. The heat exchanger and other associated components may be disposed at the normally high voltage end of the pothead. The current



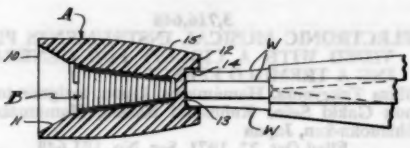
carrying capacity of the cable within the pothead is thereby effectively increased, together with the energy transferring capabilities of the cable system with which it is associated, without degradation of the dielectric characteristics of the cable termination.

3,716,653

WIRE SPLICE GAUGE AND CONNECTOR

Charles T. Willmarth, 1245 S. Beverly Glen Blvd., Los Angeles, Calif.

Filed Dec. 13, 1971, Ser. No. 207,194
Int. Cl. H01r *5/00*
U.S. Cl. 174—87 **6 Claims**



A wire splicing connector that longitudinally aligns the terminal ends of a plurality of conductors in a common plane and that confines the said conductors within a maximum diameter adapted to be spliced thereby, and comprised of a hollow cap-shaped body within which a tapered helix of conductive wire twists onto and constrictively engages a bundle of conductors established by the hollow body and its cap wall which closes the same so as to establish both a gauge and a closed connector.

3,716,654

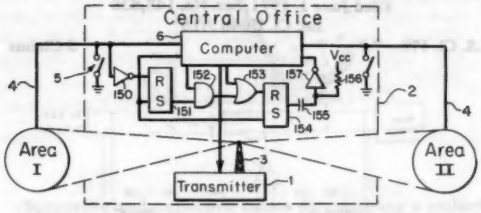
REAL TIME REMOTE USE METERING FOR BROADCAST RECEIVERS

Melvin C. Hendrickson, 605 Gladys, Elmhurst, Ill.; Richard G. Merrell, 7S713 Sierra Drive, Westmont, Ill., and Wilbert Parisoe, 1905 Garland Avenue, Highland Park, Ill.

Filed June 30, 1971, Ser. No. 158,413
Int. Cl. H04n *1/44;* **H04b** *1/00*
U.S. Cl. 178—5.1 **24 Claims**

A system is disclosed for providing real time remote use metering of the receivers in an over-the-air pay TV system of the

type in which a characteristic of the composite video signal is varied between different conditions from time to time in accordance with a predetermined code schedule and in which a composite code signal having a plurality of components whose permutation varies in relation to the code schedule is broadcast from a transmitter associated with a central office to all receivers in the system concurrently with the coded composite video signal, and in which there are a multiplicity of code-signal component permutations for each composite video signal condition. Associated with each receiver in the system is a decoder responding to the composite code signal to decode the coded composite video signal, and each of the decoders has a permutation device responsive to a different

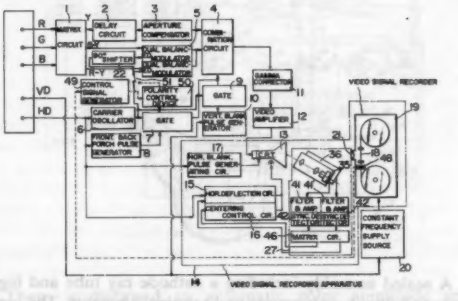


permutation of the code signal components to develop a predetermined response signal. A common return link links all of the receivers in the system to the central office. The transmitter sends different ones of the multiplicity of code signal component permutations upon different recurrences of a given composite video signal code condition so that response signals are sequentially developed by those of the decoder permutation devices which are in current use. The response signals are then returned to the central office by the common return link. The response signals are returned in time sequence correlated with that of the different code signal component permutations sent by the transmitter. The system also includes provision for remotely disabling any selected decoder from the central station.

3,716,655
RECORDING AND REPRODUCING SYSTEM OF A COLOR TELEVISION SIGNAL BY USING MONOCHROMIC RECORDING FILM

Soichi Iwamura, Fuchu City, Tokyo; Hotaka Minaguchi, Kozagun, Kanagawa Pref., and Keisuke Murasaki, Shinjuku-ku, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,313
Claims priority, application Japan, May 22, 1969, 44/39446
Int. Cl. H04n *5/86, 9/34*
U.S. Cl. 178—5.4 CD **12 Claims**

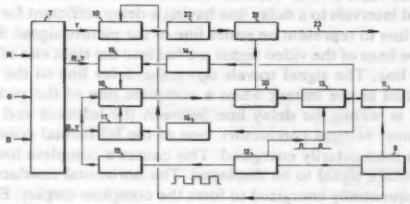


A recording and reproducing system of a color television signal by using monochromic photographic film, wherein one field of the color television signal is recorded sequentially in the plane of a frame of the photographic film by two-dimensional scanning, and the burst signal is recorded as a stripe like pattern on the film in the position out of the recorded frame. During the reproduction, said frame portion and the stripe pattern portion are scanned by a same scanning light and the light outputs are converted into electric signals by applying photoelectric conversion. By this means, a color television signal having correct hue may be obtained, since the reproduced color video signal and the burst signal have no relative phase deviation owing to a fact that their phases variate simultaneously. The scanning light for the recording and reproducing may be obtained from a cathode ray tube device, wherein burst photo spots are inserted at the end portions of the scanning line on the display surface of the cathode ray tube and by detecting direction and amount of deviation of the scanning line and applying feed back to the scanning deflection, it is possible to maintain the position of the scanning line and the luminance of the scanning spot toe constant.

3,716,656
COLOR TELEVISION SYSTEM FOR ELIMINATION OF PHASE ERRORS

Francois Lambert, Paris, and Andrzej Bartosiak, 92 Meudon, both of France, assignors to Centre Electronique De France, Paris, France

Filed Feb. 3, 1971, Ser. No. 112,226
Int. Cl. H04n *9/02, 9/32, 9/42*
U.S. Cl. 178—5.2 R **19 Claims**



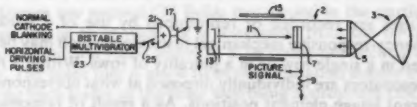
A color television system in which two color difference signals are transmitted separately by modulating a sub-carrier with one signal during odd-numbered lines and the other during even-numbered lines, to avoid the adverse effects of phase errors.

A color burst is used as a marker for one of said signals, and is only transmitted during the relevant line periods. Code translators for producing such a signal from an NTSC signal are described, and also adaptors which enable NTSC receivers to function correctly with either an NTSC input or an input coded in accordance with the invention.

3,716,657
APPARATUS FOR INCREASING SIGNAL TO NOISE RATIO IN TELEVISION LOW LIGHT LEVEL SCENES

Le Roy L. Niemyer, Jr., Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 9, 1969, Ser. No. 814,720
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **9 Claims**



A circuit arrangement for increasing the signal-to-noise ratio of the picture output signal of a television camera tube

by alternately blanking the scanning of the image applied to the tube during at least one line scanning period and scanning, during a following line scanning period, a band which covers an adjacent image portion associated with the at least one blanked scanning line.

3,716,658

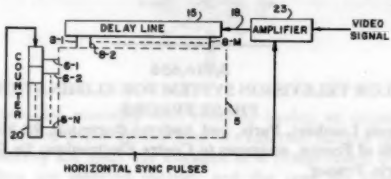
LIQUID-CRYSTAL TELEVISION DISPLAY SYSTEM

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 645,743, June 13, 1967, Pat. No. 3,513,258. This application April 9, 1970, Ser. No. 27,097

Int. Cl. H04n 5/66

U.S. Cl. 178—7.3 D **12 Claims**



A television system having a horizontal and vertical arrays of parallel conductors with a liquid crystal film interposed between them. The vertical conductors are connected at spaced intervals to a delay line having a delay sufficient for the delay line to represent an entire line of the picture signal. Successive lines of the video signal are fed into the right end of the delay line. The signal travels down the delay line to the left end. Just at the instant when a complete line of the picture signal is within the delay line between the leftmost and the rightmost vertical conductors, one of the horizontal conductors is momentarily energized. This causes a complete line of the picture signal to be displayed. The horizontal conductors are sequentially energized to form the complete display. Each line of the display is formed as a unit at the end of the reception of a complete line of the video singal.

3,716,659

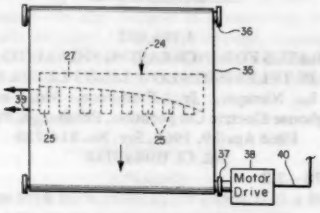
FREQUENCY DOMAIN IMAGE PROCESSING APPARATUS

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed April 9, 1971, Ser. No. 132,847

Int. Cl. H04n 1/22, 3/02, 5/44

U.S. Cl. 178—7.3 D **17 Claims**



Images are recorded or reproduced by use of a bank of frequency-responsive mechanical resonators which may be arranged in a single row or in a plurality of rows. Within a row, the resonators are individually disposed at what correspond to different image element positions. As a result of response of the resonators, either in reflecting light or in making or responding to a record, the action of the resonators is correlated with a recording or reproducing medium so that either an image is produced or an electrical signal is developed that defines an image. Display may be either of the television or facsimile type. Whatever the particular mechanism of reproduction or recording, use is made of frequency-responsive mechanical resonators to define different image element positions in a frequency-domain image processing system.

3,716,660

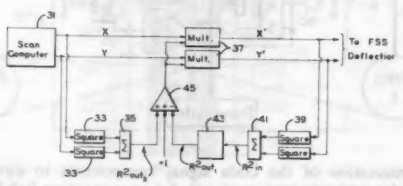
APPARATUS TO IMPROVE RESOLUTION IN A SCANNED TRANSPARANCY SYSTEM

David Friedman, Framingham, Mass., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed June 1, 1971, Ser. No. 148,838

Int. Cl. H04n 3/16

U.S. Cl. 178—7.7 **3 Claims**



Apparatus to improve resolution and decrease distortion in system wherein a video signal is obtained by scanning a transparancy in a manner which requires increased scan speeds as the scanning spot moves away from the center is shown. A radial distortion lens having high axial demagnification decreasing toward the edges is placed between the scanner and transparancy and means are provided to correct the scan so that the combined output of the scanner and lens is the same as the scanner alone, the combined system resulting in a smaller spot size on axis and a decrease in required scanning speed toward the edges.

3,716,661

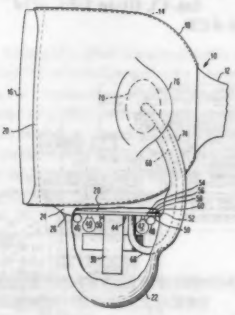
CATHODE RAY TUBE MODULE

James C. Greeson, Jr., Woodstock, N.Y., assignor to International Business Machine Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,673

Int. Cl. H01j 29/06, 29/96

U.S. Cl. 178—7.8 **7 Claims**

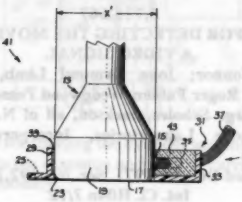


A sealed assembly including a cathode ray tube and high voltage power supply source and terminal elements. The high voltage portions of the power supply and the anode cable and terminal are all enclosed by an implosion safety shroud over the funnel of the tube. The unitary assembly can be replaced as a whole without exposing service personnel to the possibility of high voltage shock.

3,716,662
SUPPORT AND HIGH VOLTAGE PROTECTIVE MEANS FOR A CATHODE RAY TUBE

Alfred D. Johnson, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated

Filed April 21, 1971, Ser. No. 135,992
Int. Cl. H04n 5/645
U.S. Cl. 178—7.8 2 Claims

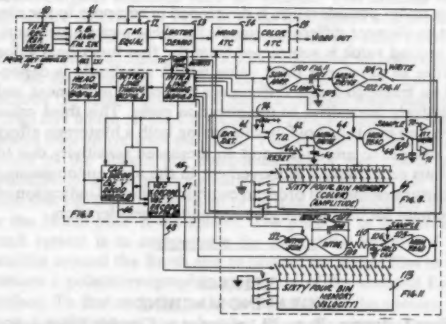


Supportive and protective means for mounting a cathode ray tube is formed of insulative material in a manner to have a planar mounting portion with an integral collar-like portion protruding therefrom. The mounting portion has an opening therethrough to accommodate the face portion of the tube. The collarlike portion is peripheral to the opening thereby providing encompassment of the face and forward portions of the tube. One area of the collar has a pocket formed therein to provide protection for the anode connection.

3,716,663
COLOR TELEVISION RECORDER-REPRODUCER SYSTEM

Thomas V. Bolger, Pennsauken, N.J., assignor to RCA Corporation

Continuation of Ser. No. 659,218, Aug. 8, 1967, abandoned.
This application Oct. 26, 1970, Ser. No. 84,173
Claims priority, application Great Britain, May 22, 1967, 23,631/67
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 AC 8 Claims

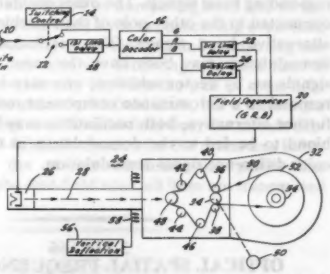


There is disclosed an automatic color amplitude and velocity error corrector for a color television recorder/reproducer system. Velocity errors which cause distortion in reproduced color video signals are corrected by combining two prior art error signals and converting the combined signal into a waveform which is more representative of the actual timing error introduced in the television signal by the record/playback process. The combined error signal is generated on a successive line-by-line basis and stored in a memory which is read at an interval during each television line to control a delay line in the recorder/reproducer color television signal playback path to afford compensation thereto. Color amplitude errors which produce saturation of the picture are compensated by comparing the level of the envelope of color bursts associated with a television line with a preset threshold signal. The resulting comparison signal is stored in a memory for each line and the memory is then accessed during the line in question to control equalization of the playback video signal by varying an attenuator located in the F.M. equalizer portion of the signal processing path. In this manner both color amplitude and velocity or phase errors in color television tape recorder/playback units are substantially reduced on a line-by-line basis.

3,716,664
SEPARATION COLOR RECORDER SYSTEM WITH RECORDING ON MOTION PICTURE FILM USING LESS THAN A FULL FIELD OF INFORMATION TO RECORD EACH FRAME OF FILM

Richard F. Dubbe, Camarillo, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1970, Ser. No. 88,641
Int. Cl. H04n 5/48
U.S. Cl. 178—5.4 CD 29 Claims



A system to provide for the production of standard motion picture color film from a color video signal or color information composed of color components. The color video signal is decoded into its separate green, red, and blue components which components form a repeating color group. Each repeating color group includes individual colors from a single color field through the use of delay. The delay of the individual colors may be in time and with a recording of the repeating color group by the use of a single gun continuous film motion electron beam recorder on a black and white separation master. The delay of the individual colors may be in space and with the recording on the black and white separation master accomplished through the use of a three gun continuous film motion electron beam recorder. The color video signal occurs at 60 fields per second (50 fields per second in particular locals) but the black and white separation master is recorded at 72 frames per second (75 fields per second in the particular locals) so as to provide for a conversion from the 60 or 50 field per second video signal to a 24 frame per second color film. The color film is made from the separation master by exposing each frame of the color film using appropriate color filters in sequence to three frames on the black and white separation master representing the green, red, and blue separation images.

3,716,665

COLOR TELEVISION RECEIVER

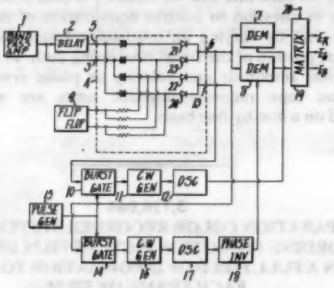
Minoru Morio, Tokyo, and Koichiro Mima, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 15, 1971, Ser. No. 153,363

Claims priority, application Japan, Nov. 17, 1970, 45/101285

Int. Cl. H04n 9/02

U.S. Cl. 178—5.4 P **12 Claims**



In a decoding system to receive PAL television signals, two synchronous demodulators are used, each connected to its own reference signal source. Both demodulators are connected to one pole of a switching circuit equivalent to a double-pole-double-throw switch and one oscillator control circuit is connected to the same pole to be controlled by corresponding burst signals. The other oscillator control circuit is connected to the other pole of the switching circuit to receive alternative burst signals. The oscillations supplied to the demodulators may both have the same phase as the burst signals or, by vector addition, one may be modified to correspond to a chrominance component modulation axis. As a further alternative, both oscillations may be selectively combined to be fed to the demodulators in the proper axes for color difference signal demodulation.

3,716,666

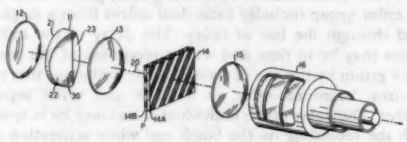
OPTICAL SPATIAL FREQUENCY FILTER

Arthur Bertel Larsen, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1971, Ser. No. 157,995

Int. Cl. H04n 9/06

U.S. Cl. 178—5.4 ST **14 Claims**



In an optical system for forming a representation of a scene at an image plane, a wedge structure of optical quality material is disposed between the scene and the image plane. The light passing through different sections of the wedge structure is deflected in different directions, forming a plurality of displaced images at the image plane. The summation of the variously displaced images results in a modulation transfer function exhibiting substantial attenuation of the spatial frequency components within a predetermined frequency range. The wedge is designed and oriented to produce angular deflections which yield specific displacements of the images and a corresponding spatial frequency rejection band. The filter may be used to avoid aliasing in color television cameras having striped color modulating gratings by utilizng the wedge to insure high attenuation in the vicinity of the spatial modulation frequency produced by the striped color gratings.

3,716,667

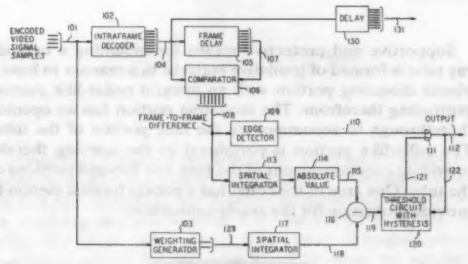
APPARATUS FOR DETECTING THE MOVING AREAS IN A VIDEO SIGNAL

Denis John Connor; John Ormond Limb, both of New Shrewsbury; Roger Fabian Wedgwood Pease, Holmdel, and William George Scholes, Jackson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Oct. 26, 1971, Ser. No. 192,283

Int. Cl. H04n 7/12

U.S. Cl. 178—6 **17 Claims**



A frame-to-frame difference signal is developed for each element-to-element difference word corresponding to a picture element in a video signal. The frame-to-frame difference signal for each picture element is combined with the same type signal for the picture element above it in the same video field and the sum is checked against a high threshold level in order to determine whether the picture element is part of a high contrast moving edge. In addition, the frame-to-frame difference signal for each picture element is combined with the frame-to-frame difference signals for all of the picture elements in a predetermined area of the picture to develop a first value whose amplitude is proportional to frame-to-frame differences caused by both movement and quantization noise. A second functional value whose amplitude is proportional to the expected quantization noise in the area of picture elements under consideration is developed in response to the element-to-element difference signals for these picture elements. The second value is subtracted from the first functional value in order to develop a third value whose amplitude is dependent on frame-to-frame differences caused by movement and is relatively insensitive to quantization noise. This third value is checked in a threshold circuit having both a hysteresis effect with respect to amplitude and an increased sensitivity due to previous recognitions of movement in the area encompassing the picture element in order to establish a second indication of movement for the picture element under consideration.

3,716,668

ENGRAVING MACHINE

William J. Barron, Peru, Ill., assignor to Graphic Electronics, Inc., LaSalle, Ill.

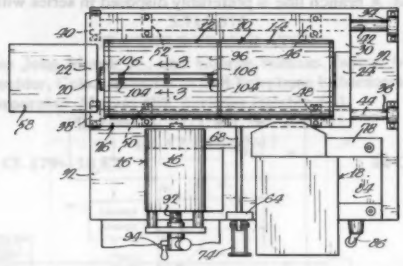
Filed Dec. 28, 1970, Ser. No. 102,018

Int. Cl. G01d 15/00, 15/28; H04n 1/24

U.S. Cl. 178—6.6 B **5 Claims**

An improved engraving machine having a cylinder on which is wrapped in side-by-side relation an image to be reproduced and a plate to be engraved with such image, including a

scanning member and a cutting member arranged adjacent respective portions of the cylinder for cooperation with the image and the plate to be engraved respectively, the apparatus

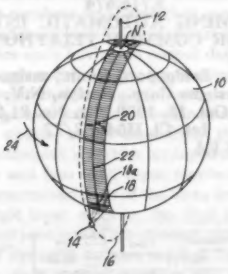


including means for rotating the cylinder and moving the same axially relative to the scanning and cutting carriages while the latter remain stationary.

3,716,669
MAPPING RECTIFIER FOR GENERATING POLARSTEREOGRAPHIC MAPS FROM SATELLITE SCAN SIGNALS

Kantaro Watanabe, c/o Japan Engineering Development Co., TBR Building, No. 10-2, 2-chome, Nagata-cho, Chiyoda-ku, Tokyo, Japan

Filed May 14, 1971, Ser. No. 143,454
Int. Cl. G01s *7/06*; G03b *27/68*; H04n *1/24*
U.S. Cl. 178—6.7 A **18 Claims**

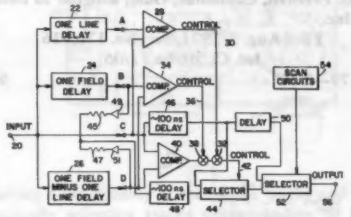


Disclosed is a system including electrical, mechanical and optical components and serving to generate polarstereographic maps of the Earth surface from scan signals sent by meteorological satellites such as Nimbus. The satellite scan signals are received by suitable radio equipment and are used to generate scan line images on a cathode ray tube having a concave face matching the Earth's curvature to compensate for the face that the satellite scans a spherical surface. The cathode ray tube is positioned along a circular track such that a scan line image on the CRT concave face is congruent with a sphere concentric with the track. Two diametrically opposite points of the sphere are designated South and North pole respectively, and a photocamera is positioned near the track such that the front nodal point of its lens is at either the South or the North pole of the sphere. The purpose of the circular track system is to compensate for the orbital motion of the satellite around the Earth and to project on planar film in the camera a polarstereographic projection of the scanned Earth surface. To that end, the cathode ray tube and the camera are moved with respect to each other along the circular track in synchronism with the orbital motion of the satellite around the Earth while the camera remains with the front nodal point of its lens at the South (or North) pole point of the track. The camera has a zoom control which keeps the front nodal point of the camera lens at the South (or North) Pole as the cathode ray tube and the camera move with respect to each other. A compensation is made for the east-west rotation of the Earth by means of rotating the camera around the North-South axis of the track. A further compensation is made for inclination of the satellite orbit from the Earth axis by means of adjusting the orientation of the camera with respect to the track plane. Lee than a 360° track may be used if a map of only a portion of the scanned Earth surface is desired.

3,716,670
COMB EFFECT ELIMINATION

John D. Lowry, Willowdale, Ontario, Canada, assignor to Elanin Investments, Ltd., Toronto, Ontario, Canada

Filed Dec. 20, 1971, Ser. No. 209,981
Int. Cl. H04n *5/84*
U.S. Cl. 178—6.7 A **8 Claims**

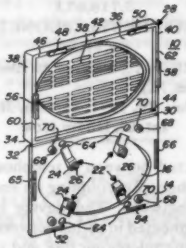


The so-called "comb effect" in the recording of video pictures on film, caused by the lateral displacement of a moving object against a contrasting background during the time interval between an odd-field scan and the corresponding even-field scan interlaced with the odd-field scan to form a frame of the video picture, is eliminated by comparing each line of the even-field scan (the prime line) with the preceding even-field line and with the preceding odd-field line, and comparing the preceding odd-field line with the following odd-field line. If the comparisons show identity between the pair of even-field lines and between the pair of odd-field lines, but a difference between the prime line and the odd-field line, the circuit substitutes adjacent odd-field information for the prime line information; otherwise the circuit transmits the prime line unchanged. During the odd-field scan, all lines are transmitted without change.

3,716,671
SPEAKER HOUSING

Earl C. Karr, Lombard, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 17, 1971, Ser. No. 144,033
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 179—1 E **8 Claims**



Speaker mounting apparatus includes a molded plastic housing having a base plate and a cover attached thereto by an integral hinge formed therebetween. Integral hinged mounting tabs are formed on the base plate adjacent a central opening therein provided to accommodate a speaker unit. The base

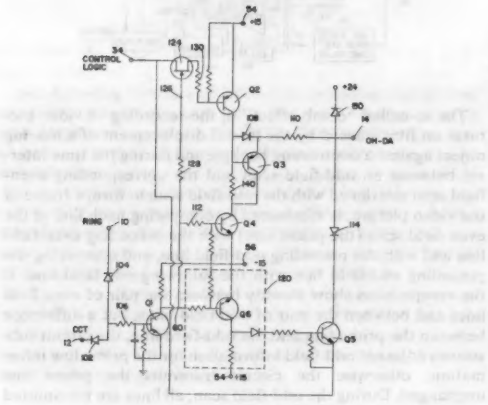
plate is positioned on an apertured panel with the central opening of the former in alignment with the aperture of the latter. The tabs are folded into the aperture and about the panel onto the opposite surface thereof. Screws extending through the base plate and panel are received in the tabs to secure the housing on the panel. The speaker unit is mounted on the base plate and the cover is swung thereover about the integral hinge. Locking tabs formed on the cover are received in apertures in the base plate to removably secure the two portions in a joined condition.

3,716,672

MODEM CBS/CBT INTERFACE

Richard D. Fretwell, Columbus, Ohio, assignor to Design Elements, Inc.

Filed Aug. 9, 1971, Ser. No. 170,116
Int. Cl. H04m *1/06*
U.S. Cl. 179—2 DP **9 Claims**



A logic interface circuit for providing appropriate on hook and off hook output states to the QH-DA terminal of either a CBS or CBT type telephone data link system. The appropriate output occurs in response to the command of the modem control logic without the necessity of switching or adapting the modem circuit during installation to the CBS or CBT system in which it is installed.

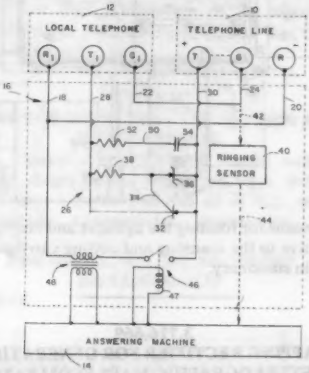
3,716,673

ANSWERING MACHINE TELEPHONE LINE COUPLING DEVICE

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, North Bergen, N.J.

Filed Nov. 29, 1971, Ser. No. 202,791
Int. Cl. H04m *1/64*
U.S. Cl. 179—6 R **9 Claims**

A device connected between a telephone line and its associated local telephone for coupling an answering or recording machine therebetween. The device includes a voltage sensing member connected in series between one standard circuitry terminal of the telephone line and its associated local telephone terminal to prohibit the transmission of voice or other audible communications from the local telephone when a telephone call is made thereto. The device also includes a ringing sensor connected to the telephone line for activating the answering machine, and a coupling switch which is moved into a closed position by the energizing of the answering machine to close the telephone line circuit loop. A line transformer is disposed in series with the coupling switch to provide a signal path to the answering machine for the recording of information from the telephone line when the coupling switch is closed. A branch line is preferably disposed in series with the



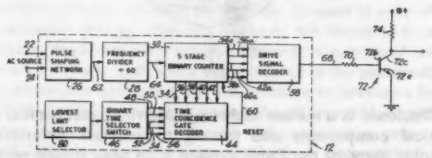
associated telephone terminals and in a parallel arrangement with the voltage sensing member to permit reception of audible signals or communications from the receiver of the local telephone.

3,716,674

VARIABLE TIMING AUTOMATIC INTERRUPTER CIRCUIT FOR COMMON TELEPHONE SENDER EQUIPMENT

George Manos, Bridgeport, Conn., assignor to Porta Systems Corp., Roslyn, N.Y.

Filed Oct. 15, 1970, Ser. No. 81,044
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FA **10 Claims**



In a telephone system employing common sender equipment an automatic interrupter circuit for connection to a common sender for disconnecting said common sender from a particular subscriber line after a predetermined period of inactivity upon said particular subscriber line. The automatic interrupter circuit comprises a timing pulse generator adapted to feed pulses having a predetermined width and selectively variable repetition rate to said common sender to cause disconnection of the same from said particular subscriber line after the reception of two successive pulses. The timing pulse generator comprises a pulse shaping network connected to a frequency divider, in turn connected to a binary counter, the output of said binary counter being applied as a first input to a time coincidence gate decoder and the second input thereto being obtained from a time selector switch. The output of said binary counter is also connected as an input to a drive signal decoder and when a coincidence is detected by said time coincidence gate decoder a reset pulse is fed therefrom to said binary counter which results in a pulse having a fixed duration at the output of

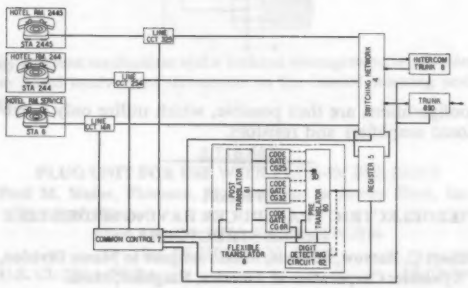
said drive signal decoder, which fixed duration pulse is indicative of the selected repetition rate of the timing pulse generator.

3,716,675

FLEXIBLE TRANSLATOR

James John Marek Jr., and George William Taylor, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 8, 1971, Ser. No. 205,802
Int. Cl. H04q 3/47
U.S. Cl. 179—18 ET **14 Claims**



A flexible translator arranged to translate one, three, and four digit input numbers into three digit output numbers. The translator includes a plurality of identical two and three terminal code gates each having an output defining the first two digits of the output numbers. The translator is arranged so that a single digit input enables digit detecting circuitry and a two terminal code gate to pass predetermined signals through the translator to obtain a corresponding three digit output number. The translator is further arranged so that the first two digits of three and four digit input numbers enable two terminals of predetermined ones of the three terminal code gates. For a three digit input number, the digit detecting circuitry enables the third terminal of preselected code gates and passes the last digit of the input number through the translator to obtain the three digit output number. For a four digit input number, the digit detecting circuitry utilizes the third digit of the four digit input number to enable the third terminal of other code gates and passes the last digit of the input number through the translator to obtain the three digit output number.

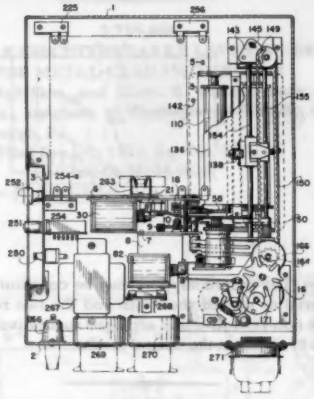
3,716,676

AUTOMATIC TELEPHONE DIALER UTILIZING MAGNETIC TAPE STORAGE WITH IMPROVED INDEXING MEANS

Kenzo Tatematsu, Amagasaki; Hiroo Hosono, Osaka; Toshio Katagiri, Neyagawa; Akira Nishikiori, Hirakata, and Takashi Minato, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma, Kadoma-shi, Osaka, Japan

Filed Dec. 28, 1970, Ser. No. 101,943
Claims priority, application Japan, Dec. 29, 1969, 44/359; Nov. 20, 1970, 45/116148; Dec. 15, 1970, 45/113892; Dec. 15, 1970, 45/113891; Dec. 15, 1970, 45/113890; Dec. 15, 1970, 45/113889; Dec. 4, 1970, 45/107700
Int. Cl. H04m 1/46
U.S. Cl. 179—90 BB **21 Claims**

An automatic dialling device in which dial impulses corresponding to dial digits of a telephone number are recorded in magnetic tape in advance and the recorded signals are reproduced as occasion demands thereby to automatically transmit the dial impulses to a telephone line for accomplishing a call. Said automatic dialling set specifically comprises a multiplicity of switches which can be individually operated to designate a multiplicity of parties to be called, wide magnetic



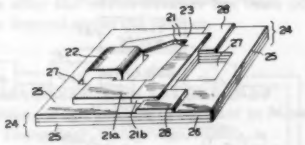
tape having a multiplicity of transverse tracks and means for automatically selecting tracks corresponding to the called parties which have been designated.

3,716,677

MULTI-CHANNEL MAGNETIC HEAD

Takashi Tanaka, and Yukihiro Yanagiuchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed June 5, 1970, Ser. No. 43,715
Int. Cl. G11b 5/16, 5/20, 5/28
U.S. Cl. 179—100.2 C **7 Claims**



A multi-channel magnetic head composed of a stack of a plurality of elementary head units. Each unit has a substantially D-shaped magnetic core having a magnetic gap. A winding is wound on said core, and a support plate is provided on which said D-shaped core is positioned. The support plate has at least one recess in which said winding is positioned. The support plate is a laminated structure having a magnetic sheet and non-magnetic sheets. The plurality of elementary head units are stacked with the gaps of the elementary head units aligned in a single straight line.

3,716,678

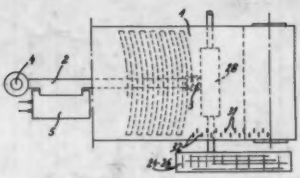
APPARATUS FOR CONTROLLING ADVANCE OF A RECORD SUPPORT AND TRANSVERSE DISPLACEMENT OF A SENSING HEAD

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Filed Nov. 9, 1970, Ser. No. 87,912
Int. Cl. G11b 21/04, 27/26
U.S. Cl. 179—100.2 T **9 Claims**

A mechanism is provided for controlling the advance of a record support and the displacement and direction of an oscil-

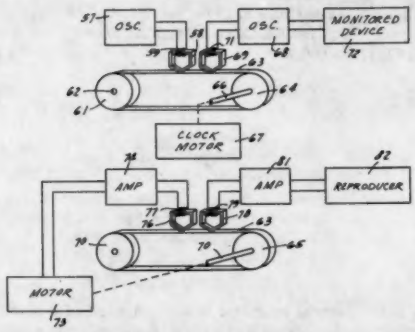
lating recording and reading head. The record support carries two rows of track marks controlling through the action of an optical means the displacement of the record support while determining at the same time the direction of the head displacement. The record support may be constituted of reflective material or coated therewith and the two rows of track marks are non-reflective and arranged successively to provide three sets of signals in the optical means.



3,716,679
VEHICLE SPEED RECORDING AND REPRODUCING DEVICES

Dieter Georg Graesslin, Klosterbergstrasse 29; Siegbert Friedrich Hils, J. G. Schultheissweg, and Kurt Ropin, Winterbergstrasse 30, all of 7742 St. Georgen, Germany

Filed Aug. 27, 1970, Ser. No. 67,404
Int. Cl. G11b 5/00
U.S. Cl. 179—100.2 S 1 Claim



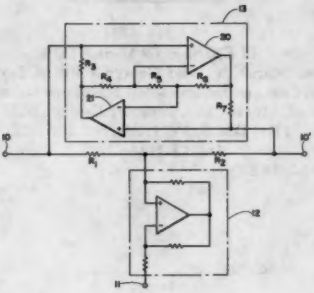
Recording devices with a recording medium which may be driven by the machine to be monitored and has a fixed frequency time track recorded on the medium. Also the recording medium can be driven at a fixed rate and the monitored device may drive a variable frequency generator which is magnetically coupled to the magnetic medium. Another modification provides mixing time reference signals and coupling the results to the magnetic medium.

3,716,680
NEGATIVE IMPEDANCE CONVERTERS SUITABLE FOR BILATERAL GAIN REPEATERS

Jin Twan Lim, Kamata, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Sept. 30, 1971, Ser. No. 185,096
Int. Cl. H04b 3/36, 3/16
U.S. Cl. 179—170 G 10 Claims

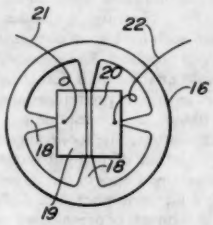
The realization of novel floating and stable negative impedances utilizing operational amplifiers has been achieved. Stable bilateral gain repeaters in two preferred configurations are thus possible, which utilize only operational amplifiers and resistors.



3,716,681
PIEZOELECTRIC TRANSDUCER HAVING SPIDER-LIKE FRAME STRUCTURE

Gilbert C. Barrow, Scituate, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Oct. 19, 1970, Ser. No. 81,891
Int. Cl. H04r 17/00
U.S. Cl. 179—110 A 11 Claims



A piezoelectric ceramic element is assembled in a spider-like frame member. The piezoelectric element and the frame cooperate to form a bilaminar vibrator with combined dimensions that determine the resonant frequency. In addition, a sound opaque mask, contained within a second spider-like frame structure, may be assembled in alignment with the spider-like frame structure containing the bilaminar piezoelectric transducer element. The mask covers a portion of the bilaminar element which vibrates out-of-phase with those other portions of the element that are exposed to the medium.

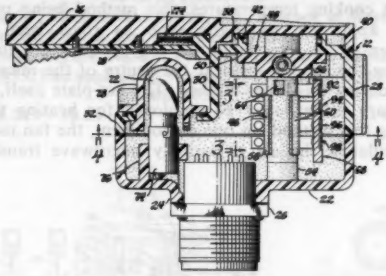
3,716,682
TURN SIGNAL SWITCH

Werner O. Wizemann, Michigan City, Ind., assignor to Meridian Industries, Inc., Southfield, Mich.

Filed Aug. 26, 1971, Ser. No. 175,232
Int. Cl. H01h 3.16
U.S. Cl. 200—61.27 7 Claims

A heavy duty turn signal switch is disclosed for use in trucks and similar road vehicles. The turn signal switch is of the "-hang-on" type (non-self cancelling and includes a hermetically sealed casing containing the switching mechanism. The switching mechanism comprises two rows of contact sets with each set being formed of flexible contact blades mounted in cantilever fashion on a printed circuit board. The contact sets are actuated by a barrel cam which is displaced by an operat-

ing lever between neutral left turn, right turn and hazard warning positions. The movement of the operating lever is indexed



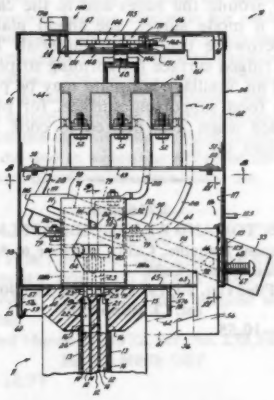
by a detent mechanism and a lockout arrangement is provided to avoid inadvertent movement to the hazard warning position.

3,716,683

PLUG UNIT FOR USE WITH PLUG-IN BUS DUCT

Paul M. Hafer, Florence, Ky., assignor to Arrow Hart, Inc., Hartford, Conn.

Filed Aug. 30, 1971, Ser. No. 176,066
Int. Cl. H01h *9/20, 33/46*
U.S. Cl. 200—50 R **15 Claims**



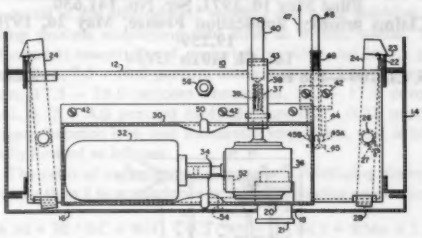
A plug unit comprising an off-on switch and a stab carrier mounted inside of a housing, the housing being adapted for interconnection with a plug-in bus duct and the stab carrier being linearly movable into and out of engagement with the bus duct's busbars after the housing has been mounted to the bus duct. The plug includes a first handle outside the housing that is manually operable for moving the stabs into and out of busbar contact after the housing has been mounted to the bus duct, and a second handle located outside the housing that is manually operable for opening and closing the off-on switch after the housing has been mounted to the bus duct. The first handle is interconnected with safety structure that requires use of both an operator's hands simultaneously to manually extend or retract the stabs into and out of busbar contact, that prevents extending the stabs into busbar contact until the plug unit is fixed to the bus duct in the final operating attitude, that prevents retracting the stabs from busbar contact unless the plug unit is fixed to the bus duct in the final operating attitude, that prevents extending the stabs into busbar contact unless the off-on switch is open, and that prevents retracting the stabs from busbar contact unless the off-on switch is open. The second handle is interconnected with safety structure that prevents opening of the housing's cover unless the off-on switch is open, that prevents closing of the off-on switch when the housing's cover is open, that allows the plug unit to be 'locked out' when desired so as to keep the off-on switch open, and that cooperates with the first handle as described.

3,716,684

PORTABLE CIRCUIT BREAKER LEVERING DEVICE FOR METAL-CLAD SWITCHGEAR

James W. McMillen, and Glenn E. Rhodes, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1971, Ser. No. 214,332
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 AA **8 Claims**



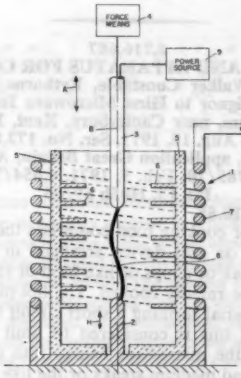
Apparatus suitable for placing on the floor or in front of the floor of a metal-clad switchgear cabinet and to be secured to cabinet. The apparatus includes a lightweight portable frame which has an electric motor and a gear reduction transmission mounted thereon to be coupled to the levering-in mechanism of a circuit breaker to be levered into or out of the cabinet. The apparatus may be operated with the cabinet door opened or closed, and it may be operated remotely and automatically. Cooperating limit switches, one of which may be disposed on the switchgear cabinet, and one of which may be disposed on the frame, provide control signals to a time delay relay which may be disposed on the frame to actuate the electric motor to an "off" state after the circuit breaker has been completely levered into or levered out of the cabinet.

3,716,685

MAGNETIC CIRCUIT BREAKER

Gerald L. Wilson, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 14, 1970, Ser. No. 71,792
Int. Cl. H01h *33/18*
U.S. Cl. 200—147 R **9 Claims**



A circuit breaker adapted to interrupt substantial values of electric current. The breaker disclosed features a magnetic

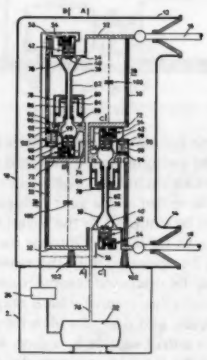
field in the region in which the break in current occurs and oriented in a direction both parallel to and radially perpendicular to the general direction of current flow at the instant the circuit is interrupted to create a kink instability in the arc thereby formed and to cause the arc to move into contact with surrounding baffles.

3,716,686

COMPRESSED-GAS MULTI-BREAK CIRCUIT-INTERRUPTER HAVING CYLINDRICAL CHAMBERS WITH ECCENTRIC CONTACTS

Jean Claude Henry, Grenoble, Georges Henry, St. Martin-le-Vinoux, and Cesar Castelli, Montfleury, France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed May 10, 1971, Ser. No. 141,630
Claims priority, application France, May 26, 1970, 19,259
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **9 Claims**



A multiple-break, compressed gas circuit-interrupter pole unit having longitudinally aligned arc extinguishing chambers of insulating material. To reduce the overall length, the axes of the contact means of successive chambers are staggered to permit overlapping of members associated with the contact means, successive chambers are staggered to permit overlapping of members associated with the contact means, such as exhaust valves or contact movement control means.

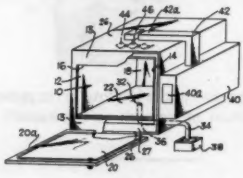
3,716,687

METHOD AND APPARATUS FOR COOKING

Ronald Jack Walker Constable, Eythorne, near Dover, England, assignor to Hirst Microwave Industries Limited, Aylesham, near Canterbury, Kent, England

Filed Aug. 18, 1971, Ser. No. 172,860
Claims priority, application Great Britain, Aug. 18, 1970, 39,785/70; Feb. 5, 1971, 4,054/71
Int. Cl. H05b *69/06*
U.S. Cl. 219—10.55 **54 Claims**

Apparatus for cooking food comprises the combination of a hot plate or grill device arranged in a microwave oven so that steak or chops or like food of relatively small thickness can be rapidly cooked. The hot-plate comprises conductive material forming a short circuit for the microwave field and this is considered to limit the depth of penetration of the microwave energy into the food, thus enabling rare and medium steaks or the like to be cooked. Further, it is found that the food can be properly browned on its surface, as well as correctly cooked in the interior regions, in very short cooking times. It is preferred that the oven also be provided with a fan for rapidly recirculating the air in the oven to enable food to be cooked by the combination of microwave energy and recirculated air at cooking temperatures, this method being particularly applicable to roasts such as roast beef, roast chicken etc. A removable tray may be provided for supporting the food in or near the centre of the microwave field during this latter method. The hot-plate itself, or an auxiliary heater, may be employed for heating the air during this method. In one embodiment, the fan used for recirculating the air is partially microwave transparent



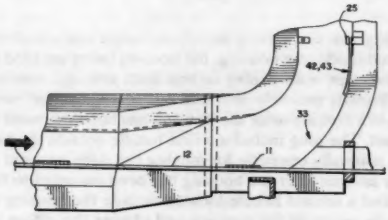
and partially of conductive material and is arranged so that the conductive parts act as a mode stirrer. The fan is preferably located behind a shield plate in the microwave cavity to draw air through a central aperture in the plate and blow it around the edges and in the case where the fan acts as a mode stirrer, the shield plate is of heat resistant microwave transparent material. The hot-plate may have a ridged surface for forming stripes on steak or the like and an auxiliary hot-plate may be provided, having a plane food supporting surface, for placing on the ridged surface when it is desired to cook food without forming stripes on it.

3,716,688

REFLECTOR AND WAVEGUIDE APPLICATOR

Ray M. Johnson, Danville, Calif., assignor to Microdry Corporation, San Ramon, Calif.

Filed Oct. 29, 1971, Ser. No. 193,907
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **11 Claims**

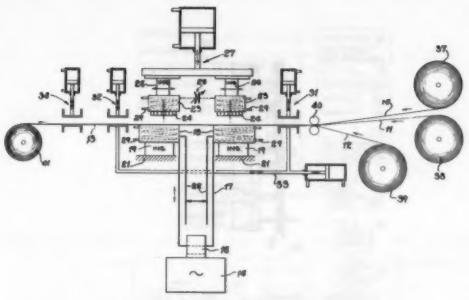


In a waveguide applicator using a water load termination for absorbing remnant power after the material being processed leaves the applicator, a metallic gate is interposed between the water load and the location at which the product exits the applicator. One edge of the gate is hinged about a broadwall of the guide, and this edge is in continuous electrical contact with the broadwall. The gate is adjustable for selective reflection of power back through the guide to make a second pass in processing the material, thereby enhancing the system's efficiency.

3,716,689
HIGH FREQUENCY DIELECTRIC HEATING PROCESS AND APPARATUS

Raymond P. Meenen, Hawthorne, N.J., assignor to Mayflower Electronic Devices, Inc., Little Ferry, N.J.

Division of Ser. No. 824,076, May 13, 1969, Pat. No. 3,596,035. This application March 15, 1971, Ser. No. 124,427
Int. Cl. H05b 9/04
U.S. Cl. 219—10.61 1 Claim

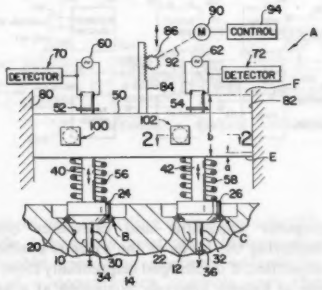


A high frequency heating machine for laminating fabrics material in which a heating electrode for each side of the material is divided into two parts and in which each of the four electrodes is preheated, the two electrodes one one side of the material dividing the load and having capacitors therebetween. Mechanism is provided for step-by-step passage of the material between the two opposing sets of electrodes in which the dies are spaced three times the effective width of one die and in which the stroke of the material for each step is twice the effective width of one die.

3,716,690
APPARATUS FOR SETTING THE AIR GAP BETWEEN AN INDUCTOR AND A VALVE SEAT

William G. Bryant, Lakewood, Ohio, assignor to Parks-Ohio Industries, Inc.

Filed March 27, 1972, Ser. No. 238,515
Int. Cl. H05b 5/04
U.S. Cl. 219—10.77 15 Claims



A device and method for setting the air gap between a valve seat and an inductor which is movable with respect thereto comprising a circuit including, in series, the inductor, the valve seat and an electrical indicating means for making an indication only when the inductor and seat are in electrical contact to complete the series circuit and means for using this circuit to set the aforementioned air gap.

3,716,691
SHIELDED ARC WELDING WITH AUSTENITIC STAINLESS STEEL

Howard E. Baybrook, Leechburg, and Joseph A. Chivinsky, Sarver, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed April 27, 1971, Ser. No. 137,957
Int. Cl. B23k 35/00
U.S. Cl. 219—137 11 Claims

An austenitic stainless steel which is suitable for use as a filler metal in gas shielded arc welding and a gas shielded arc welding process employing said steel as a filler metal. The steel consists essentially of, in weight percent, up to 0.1 percent carbon, 7.5 – 16.0 percent manganese, up to 1.0 percent silicon, 17.5 – 26.0 percent chromium, 5.0 – 17.0 percent nickel, 0.75 – 4.0 percent molybdenum, 0.2 – 0.38 percent nitrogen, balance iron and incidental impurities, and is additionally limited as follows:

1. The ratio of austenitizing elements to ferritizing elements is greater than 1 in accordance with the following expression:

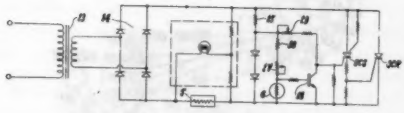
$$[\%\,Ni + 30\,(\%C + \%N) + 0.5\,(\%Mn)]/[\%Cr + \%Mo + 1.5\,(\%Si)] > 1$$

2. The manganese to nitrogen ratio is at least 42; and
3. The sum of the chromium, manganese, nickel and molybdenum content is at least 38.

3,716,692
TEMPERATURE CONTROLLED SOLDERING IRONS

Rudolf Schick, 181 High Street; Robin William Mackie, 15 Livingstone Street, and Alan Lindsay Royston, 1 Mountfield Road, all of Victoria, Australia

Filed Feb. 19, 1971, Ser. No. 117,014
Claims priority, application Australia, July 16, 1970, 17701/70
Int. Cl. H05b 1/02; B23k 3/04
U.S. Cl. 219—241 5 Claims

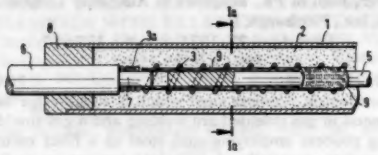


A temperature controlled electrical soldering iron includes a soldering tip removably secured in a nickel or nickel alloy barrel. An electric heating coil is wound around the barrel and heating current is supplied thereto through a solid state SCR temperature control circuit. The control circuit includes a nickel wire temperature sensing element wound about the barrel in axially displaced, non-overlapping relationship to the heating coil with the sensing element being in closer proximity to the soldering face of the soldering tip than the heating coil. The variation in resistance of the sensing element as the soldering tip temperature changes causes the SCR to be turned on andoff through a triggering circuit including a transistor and a silicon controlled switch.

3,716,693
TUBULAR HEATING ELEMENT

Richard Bleckmann, Moserstrasse 29, Salzburg, Austria

Filed May 17, 1971, Ser. No. 143,990
Claims priority, application Austria, May 21, 1970, 34535
Int. Cl. H05b 3/10
U.S. Cl. 219—553 18 Claims

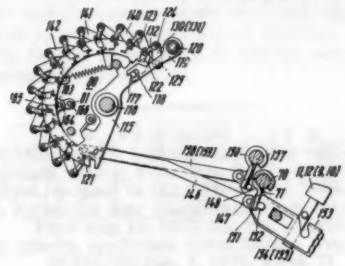


An electrical tubular heating element comprises an outer tube of metal and at least one electrical heating resistance, which is arranged in the outer tube. The zone adjacent to the inner wall of the outer tube is filled with magnesium oxide or another insulating material with a high melting point. Immediately adjacent to the heating resistance at least one layer or glass or another additional insulating material is provided so that when the temperature of the outer tube reaches a certain maximum value, a leakage current sufficient for switching off the tubular heating element flows between the coils of the heating resistance or a wire core arranged inside this heating resistance.

3,716,694
BLOCKING DEVICE FOR REGISTERING BUSINESS MACHINES

Gerhard Rethmeier, Oldentrup, Germany, assignor to Anker-Werke AG, Bielefeld, Germany

Filed Sept. 23, 1970, Ser. No. 74,619
Claims priority, application Germany, Sept. 24, 1969, P 19 48 233.6
Int. Cl. G07g 1/00
U.S. Cl. 235—7 R 9 Claims

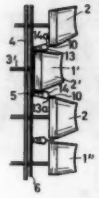


Blocking device for registering business machines having a keyboard field including number key banks and amount-key banks, including blocking means operatively connected to and adjustable by keys of the number key banks and of the amount-key banks, and sensing members cooperating with the blocking means for releasing a respective machine run, the blocking means being formed with locking and releasing profiles for locking the keys as well as for intermediately locking the sensing members and for completely releasing the sensing members from controlled condition thereof.

3,716,695
KEYBOARD LOCKING ARRANGEMENT

Josef Hauger, Villingen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany

Filed May 24, 1972, Ser. No. 256,582
Claims priority, application Germany, May 27, 1971, P 21 26 286.2
Int. Cl. G07g 1/00
U.S. Cl. 235—26 15 Claims

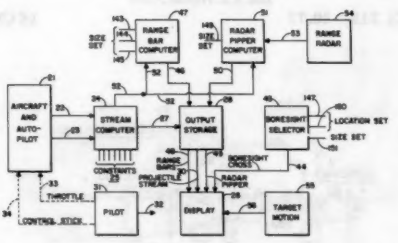


Between pairs of adjacent keys or key buttons, of a keyboard on which the keys are mounted in crossing columns and rows, resiliently bendable locking plates are mounted on a support plate so that in the normal position of the locking plate, adjacent keys cannot be simultaneously depressed. When only one key is depressed, the respective locking plates are resiliently bent to locking positions located under the adjacent keys which then cannot be depressed.

3,716,696
PROJECTILE STREAM DISPLAY APPARATUS

Arthur F. Hayes, Fridley, and Robert L. Schultz, Edina, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Sept. 4, 1970, Ser. No. 69,536
Int. Cl. G06f 15/58
U.S. Cl. 235—61.5 E 16 Claims



Digital computer apparatus and computer controlled process for displaying the locus of the present positions of a plurality of projectiles, if discharged sequentially from a freely moving vehicle at known intervals beginning at a predetermined time in the past, as seen from a predetermined point in the vehicle, including computer means for iteratively determining said present positions and for modifying the locus in accordance with changes in parameters of the movement of the vehicle and the projectiles: also included are means for identifying points on the locus at selected distances from the vehicle.

3,716,697

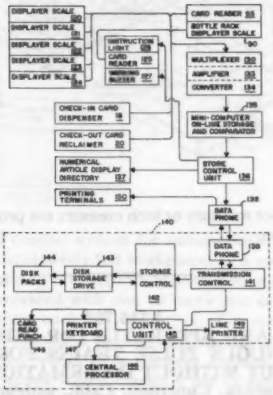
AUTOMATIC MARKETING SYSTEM

Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 825,260, May 16, 1969, abandoned. This application May 5, 1971, Ser. No. 140,620

Int. Cl. G06r 3/00; E04h 3/04

U.S. Cl. 235—61.9 R 12 Claims



In a self service store, sales display fixtures are provided with means for sensing the weight of articles supported thereon, while card readers are associated with the fixtures to identify customers selecting articles therefrom. Data processing equipment scans the weight sensing means and the card readers while customers are shopping, and upon completion thereof, provides each customer with a printed invoice of the articles selected and the cost of the articles.

3,716,698

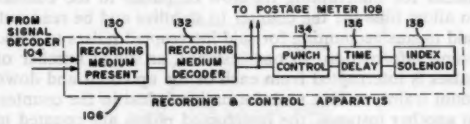
CONTROL AND RECORDING APPARATUS

Luther G. Simjian, Greenwich, Conn., assignor to General Research, Inc., Greenwich, Conn.

Filed Sept. 2, 1971, Ser. No. 177,316

Int. Cl. G06k 1/02; H04q 1/00

U.S. Cl. 235—61.1 17 Claims



A control and recording apparatus operable in conjunction with a remotely controlled instrumentality includes a removable recording medium adapted to record the arrival of a signal which controls such instrumentality. Means are provided to sense that the medium is of proper character and present in predetermined position. In the absence of a medium or if it is not of the proper character operation of the instrumentality is blocked. The apparatus includes resetting means which become operable upon the removal of the recording medium from the apparatus.

3,716,699

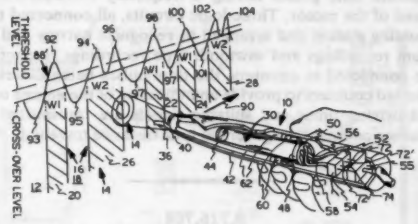
METHOD AND APPARATUS FOR OPTICAL CODE READING

Alton B. Eckert, Jr., 79 Tollsome Avenue, Norwalk, Conn., and Howell A. Jones, Jr., 176 Taunton Road, Fairfield, Conn.

Filed April 2, 1971, Ser. No. 130,638

Int. Cl. G06k 7/10; E04g 17/00

U.S. Cl. 235—61.11 E 13 Claims



Reading of a binary printed code consisting of width-coded elements is described. Radiation from a scanning spot is directed at a pair of photo-detectors which are responsive to radiation from concentric areas of the scanning spot. The signals from the photo-detectors are used to produce an analog comparison output representative of the difference between the amount of radiation incident upon the respective detectors. The scanning spot size is selected in view of the width of the code elements so that, during a scan of the reader, narrow code elements are identified by a single excursion, and wide code elements are indicated by a double excursion in the comparison output. Logic circuitry is provided to recognize the single and double excursions in the comparison output, and provide output signals representative of the binary code.

3,716,700

INSTRUMENT FOR AUTOMATICALLY MAKING EVALUATIONS FROM RECORDING CHARTS

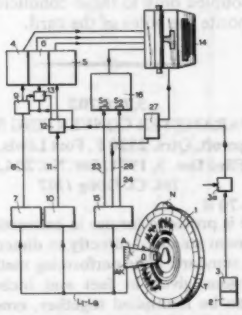
Heinz Kelch, Buchenberg; Josef Krickl, Bad Durrheim; Eduard Schuh, and Siegfried Spauszus, both of Villingen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed Jan. 26, 1972, Ser. No. 220,994

Claims priority, application Germany, Jan. 30, 1971, P 21 04 351.6

Int. Cl. G06k 11/00

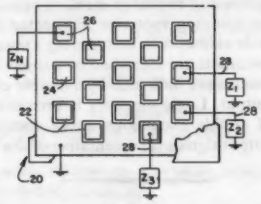
U.S. Cl. 235—61.6 A 25 Claims



An apparatus has a rotating table which rotates at a predetermined speed. A tachograph chart having wide and

narrow beam recordings as well as sawtooth type recordings recorded in adjacent tracks is placed on the rotating table. A scanning station has a plurality of photo diodes arranged in a direction perpendicular to the tracks, the photo diodes being arranged adjacent to each other in a row whose length dimension is greater than the width of any recording and is movable so it can be positioned opposite any recording to be evaluated. A motor drives the rotating table at the predetermined speed and controls a pulse generator to thereby cause the latter to generate time pulses having a frequency correlated to the speed of the motor. Three logic circuits, all connected to the scanning station and arranged to recognize narrow and wide beam recordings and sawtooth type recordings respectively, are connected to counters, the time pulses being directed to selected counters to provide an indication of the engine off, on and driving times and suitable signals are transmitted to a distance counter to register the total distance travelled.

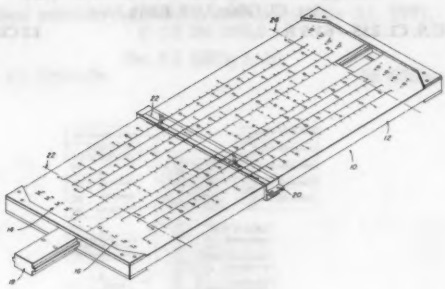
3,716,701
ENCODED DATA CARD SYSTEM
David J. Cohen, 9614 N. Crawford, Skokie, Ill. 60604
Filed Nov. 9, 1970, Ser. No. 87,774
Int. Cl. G06k *7/08*; G11b *25/04*
U.S. Cl. 235—61.11 H **18 Claims**



This invention relates to a high bit density encoded data card and code detector wherein the data is concealed from the observer thereof. The card comprises a thin metallic plate of a non-ferrous or ferrous material in which a plurality of holes are selectively placed. The code detector comprises a plurality of conductive squares or circles upon an insulated board; the holes of the card being selectively placed to correspond spacially with the conductors of the board. When an audio frequency voltage is applied in proximity to the card by means of a conductive plate placed thereon but insulated therefrom, voltage will be capacitively coupled only to those conductors of the board which are opposite the holes of the card.

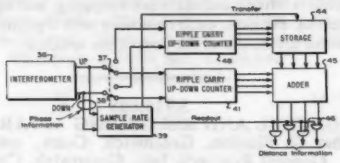
3,716,702
MULTI-PARAMETER CONVERTING SLIDE RULE
Francis J. Hopcroft, Qtrs. 2520 F, Fort Lewis, Wash.
Filed Dec. 3, 1971, Ser. No. 204,564
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **4 Claims**

A slide rule is provided for use in converting dimensions in one measurement standard directly to dimensions in another measurement standard while performing mathematical operations. Dimensions given in feet and inches or in metric parameters can be multiplied together, cross-multiplied, divided individually or divided one by the other with an answer indicated directly on the appropriate scale in either parameter. The slide rule includes a body with a pair of rails and a slide movably mounted between the rails. An indicator with a hairline is slidably mounted to the body and conventional C and D scales are provided along the rails and along the slide. Additional C scales selectively folded for indicating in metric



measure, foot measure or inch measure are provided along the body portion.

3,716,703
METHOD AND APPARATUS FOR INTERRUPTING CONTINUOUS PULSE TRAINS FOR COUNTER READOUT WITHOUT INFORMATION LOSS
Gary B. Gordon, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 9, 1970, Ser. No. 17,529
Int. Cl. G06m *3/04*
U.S. Cl. 235—92 PL **18 Claims**

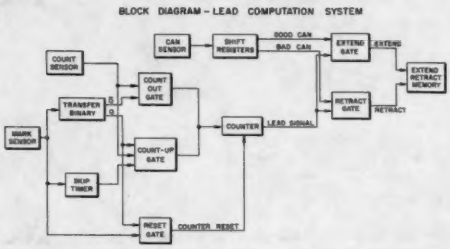


A pulse counter system for determining the difference tally count between the pulses of two continuous trains of incoming pulses with an up-down counter includes means for interrupting the flow of pulses to the counter to allow time for the counter to stabilize and be read out, said means accounting for said interrupted pulses to avoid losing information. In one instance, an equal number of pulses is interrupted from each of the up count and down count trains, so that no information is lost in the counter. In another instance, the interrupted pulses are counted in an auxiliary up-down counter, the difference count being taken from the auxiliary counter and digitally added into the main counter after each readout of the main counter. In another embodiment, the difference count of the pulses in the interruption period is kept in the auxiliary counter, the output of the main counter and the auxiliary counter being added together digitally to give the count output. In another embodiment anticoincidence circuitry and gates are used for feeding the interrupted pulses serially back into the main counter from the auxiliary counter after each readout of the main counter to accomplish addition. Also, two up-counters plus a subtraction circuit may be used to perform the functions of a reversible or up-down counter and anticoincidence circuitry.

3,716,704
ELECTRICAL CONTROL SYSTEM

Kenneth P. Dixon, Lakewood, Colo., assignor to Systems Engineering Associates, Inc., Wheat Ridge, Colo.

Filed July 8, 1970, Ser. No. 53,197
Int. Cl. G06m 3/14
U.S. Cl. 235—92 PD 8 Claims

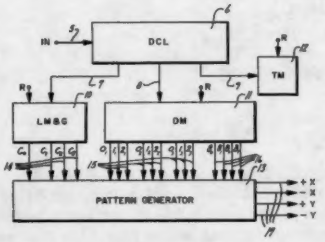


An electrical control system for automatically controlling operations on successively fed workpieces in a variable speed machine, comprising a workpiece scanning sensor, a rotating timing wheel provided with one or more sets of electrically countable devices, each set consisting of a predetermined number of said countable devices equi-spaced apart circumferentially on the wheel or a segment thereof, said wheel revolving at a speed which causes a set of said countable devices to pass one workpiece station in one revolution or a predetermined part of one revolution of the wheel depending on the number of sets of said devices on the wheel, and including a mark sensor, a count sensor, and count-up and count-out counters connected to the count sensor for counting the timing wheel devices to measure the speed of operation of the machine and to measure the lead time and for generating a signal at the end of the lead time, the combined counts of the count-up and the count-out counters being equal to the output of one set of said countable devices.

3,716,705
PATTERN GENERATOR AND METHOD

Richard M. Newell, 1204 St. Mary Drive, Livermore, Calif.

Filed Aug. 18, 1970, Ser. No. 64,774
Int. Cl. G06f 15/20
U.S. Cl. 235—151 12 Claims

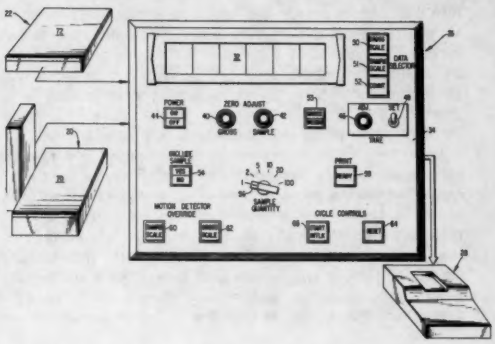


Pattern generator and method for generating functional representations of line segments consisting of discrete increments. Standard logic elements are utilized in tree networks which successively combine length and direction input data of different orders of magnitude to produce line segment representations of increasing orders of magnitude. The tree networks are constructed in stages which can readily be cascaded to increase the numbers of increments and line segments which can be generated.

3,716,706
PIECE COUNTING SYSTEM

Alden J. Gray, Wallingford, Vt., assignor to Howe Richardson Scale Company, Clifton, N.J.

Filed April 1, 1971, Ser. No. 130,291
Int. Cl. G01g 19/413
U.S. Cl. 235—151.33 20 Claims

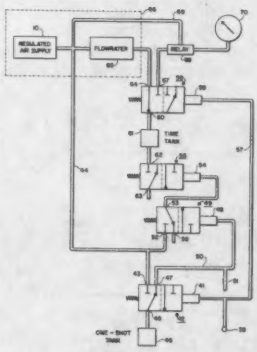


A piece counting system for determining the number of pieces in a lot by recurrently advancing a counter circuit from a predetermined starting count to coincidence with a digital signal that represents the weight of a known number of said pieces and by supplying a quotient signal each time coincidence is reached until the summation of counts that the counter circuit has been advanced by becomes equal to or greater than a digital signal representing the weight of the unknown number of pieces.

3,716,707
PNEUMATIC RATEMETER AND COUNTER

Martin J. Sharki, 3202 Merrick, Houston, Tex., and Phil H. Griffin, 412 East Gaywood, Houston, Tex.

Filed Dec. 29, 1971, Ser. No. 213,675
Int. Cl. G06m 1/00
U.S. Cl. 235—200 9 Claims



A one-shot sensor valve receives a mechanical force from pump rod movement and operates to pressurize a one-shot air tank from a regulated air supply. When the pump rod moves back to its original position, the one-shot tank is discharged into fluidic logic circuitry which energizes a counter and passes the air signal to a ratemeter transfer valve and into a

one-shot storage valve. The one-shot storage valve stores air pressure in a second one-shot air tank and a time air tank receives compressed air at a constant and predetermined rate from a flowrater through the ratemeter transfer valve. When the transfer valve is energized, the pressure in the time tank is transferred through a booster relay to a readout device. As the signals are coupled from the counter to the ratemeter, the second one-shot air tank is released into a dump pilot valve operator and a dump valve to discharge the time air tank. In the time between the dumping of the time tank and its transfer into the readout device, the time tank is building pressure at a set rate determined by the flowrater. The time between pulses is then represented by a pressure buildup in the time tank. In an alternative embodiment, the flowrater is replaced with a timing motor which drives a timing disc having a hole therethrough which causes air to be passed alternately through a pair of air switches which respectively cause an air volume tank to be pressured up and dumped at a rate commensurate with the rotation of the disc. Based upon the principal that when a given volume of air at a given pressure is allowed to expand into a second volume on a timed cycle, the resultant pressure at any time is a measure of the time from the first cycle to the time of measurement, the pressure in the air timing tank at any time is thus proportional to the rate of pulses generated by the one-shot sensor valve or by the mechanical force that causes the one-shot sensor valve to operate.

3,716,708

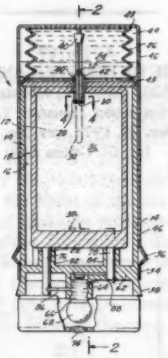
FLASHLIGHT WITH RESERVE CELL

Gordon E. Kaye, Irvington, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 17, 1970, Ser. No. 64,456

Int. Cl. F21l 7/00

U.S. Cl. 240—10.6 R **7 Claims**



A reserve cell battery serves as a handle for a flashlight, made to be an economical throw-away unit to be discarded after the cell is used up.

3,716,709

ZERO LUMINANCE LIGHTING PANEL

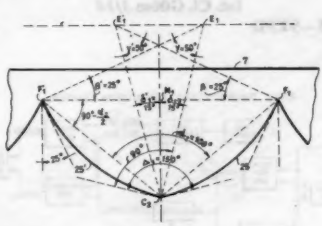
Ingacio Goytisolo Taltavull, Calle Madrazo, 83, Barcelona, Spain

Filed June 14, 1971, Ser. No. 152,726

Int. Cl. F21v 5/04

U.S. Cl. 240—106.1 **10 Claims**

A transparent prismatic lighting panel, having on its exterior surface a multiplicity of pyramids or cones having curved lateral surfaces. The curvature being such that substantially all of the light rays refracted through these surfaces form, with the axis of the pyramid or cone, angles which do not fall between 60° and 90°. As a result of which the panel gives rise to substantially zero luminance.



3,716,710

LAMP COMPRISING AN ELONGATED LIGHT SOURCE, PARTICULARLY A ROD-SHAPED FLUORESCENT LAMP, AND SHADE OF TRANSPARENT MATERIAL

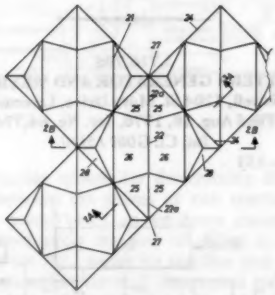
Friedrich Clostermann, Hagen, and Han-Joachim Richter, Neheim-Husten, both of Germany, assignors to Trilux-Lenze KG, Neheim-Husten, Germany

Filed April 16, 1970, Ser. No. 29,088

Claims priority, application Germany, April 21, 1969, P 19 20 071.6

Int. Cl. F21v 5/00

U.S. Cl. 240—106 R **9 Claims**



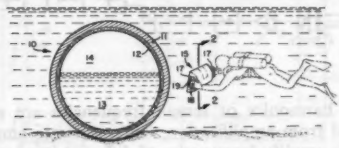
A lamp comprising an elongated light source, such as a rod-shaped fluorescent lamp, and a lamp shade of transparent material. The lamp shade has its surface provided with a first set of grooves defining ridged elevations between them and extending parallel to the axis of the elongated light source, and two sets of diagonal grooves symmetrically crossing said first set of grooves in such a manner that the vertex lines defining the bottoms of the troughs formed by the diagonal grooves intersect on the lines of the ridges between neighboring longitudinal grooves and thereby divide the surface into panels of which each contains a prismatic center configuration having a face on each side of a longitudinal ridge, two quarter faces divided by a hip at each end of the ridge and a triangular base pyramid adjoining the foot of the face on each side of the ridge.

3,716,711

WATER LEVEL GAUGE USING NEUTRON SOURCE

Bernhardt D. Olesen, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed June 18, 1971, Ser. No. 154,321
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 4 Claims



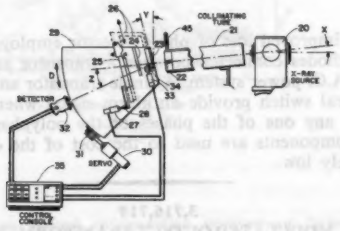
A radioactive source of energy emitting neutrons is placed adjacent a sunken hull and neutrons pass relatively unimpeded through the steel hull and, if included, an internal thermal insulator to a compartment interior. If the compartment is unflooded, most neutrons continue on their way, but if the interior is filled with water, a great many of the neutrons are partially backscattered as they encounter the water medium with a percentage of the backscattered neutrons impinging on a particle detector. The particle detector produces signals representative of the backscatter intensity to an indicator which provides an indication to a diver as to whether or not a compartment is flooded. By relocating the invention along the vertical dimension of the compartment and noting where there is an insignificant level of back-scattering, the level to which the chamber is flooded is determined from the vessel's exterior.

3,716,712

APPARATUS FOR AND METHOD OF ORIENTING CRYSTAL WAFERS

Bernhard Peter Piwczyk, Kanata, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 27, 1971, Ser. No. 183,782
Int. Cl. G01n 21/00
U.S. Cl. 250—51.5 11 Claims



Method of and apparatus for orienting crystal wafers, particularly for producing X-ray diffraction topographs. The wafer is mounted slightly inclined to the vertical and rotation about the θ and γ axes is carried out under control of circuits responsive to the intensity of diffraction. The wafer is oriented automatically at a rotative position giving maximum diffraction for each axis. To produce a topograph, scanning of the wafer is provided.

3,716,713

INPUT SCREEN FOR IMAGE DEVICES HAVING REDUCED SENSITIVITY IN THE CENTAL REGION

Nathan D. Levin, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 9, 1969, Ser. No. 790,144
Int. Cl. H01j 1/62
U.S. Cl. 250—80 3 Claims

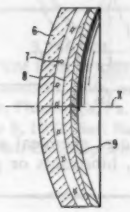


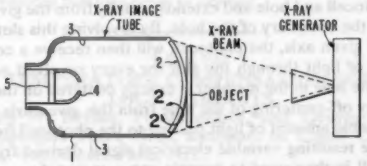
Image device input screen having greater image conversion efficiency in the peripheral region of the screen than in the central region. Preferred embodiments include, separately or in combination, a screen scintillator having the shape of a diverging meniscus, a semi-transparent screen filter layer having the shape of a converging meniscus, and variations in regional compositions of a screen photocathode.

3,716,714

X-RAY IMAGE TUBE HAVING AN OXIDIZED VANADIUM BARRIER INTERPOSED BETWEEN THE SCINTILLATOR AND PHOTOCATHODE

Andreas Niewold, Sunnyvale, and Judith Q. Pon, Cupertino, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 15, 1968, Ser. No. 776,089
Int. Cl. G01t 1/20
U.S. Cl. 250—83.3 13 Claims



An X-ray image tube is disclosed having a glass barrier comprising oxidized vanadium interposed between the tube scintillator and photocathode.

3,716,715

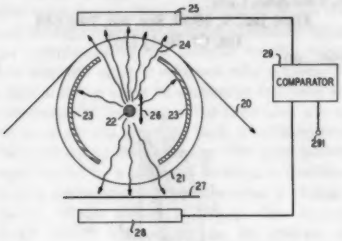
THICKNESS MEASUREMENTS USING THE MOSSBAUER EFFECT

Richard Lewis Cohen, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Dec. 4, 1970, Ser. No. 95,126
Int. Cl. G01t 1/16
U.S. Cl. 250—83.30 5 Claims

Resonant gamma ray absorption techniques (Mössbauer effect) are used to monitor the thickness of foils or deposited layers containing tin, iron and a number

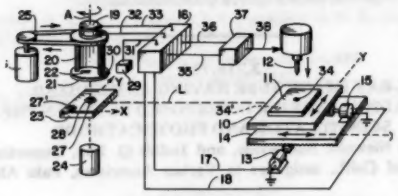
of other elements. The measurements are non-destructive and largely independent of environmental factors such as surface residues (e.g., chemical salts or dirt) and surrounding fluids (e.g., lubricants or plating baths).



3,716,716
PHOTOELECTRIC TWO AXIS POSITIONING SYSTEM

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif.

Filed Aug. 26, 1971, Ser. No. 175,258
Int. Cl. G01j 1/20
U.S. Cl. 250—203 R **7 Claims**



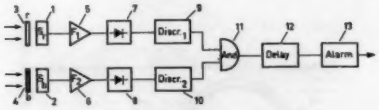
A member is capable of being positioned at precise rectangular coordinate points by providing a circular hole in the member. A light source is positioned on one side of the member and a photocell on the other side to receive light passing through the hole along a given axis corresponding precisely to the coordinate points. A slot is provided between the photocell and hole and extends radially from the given axis beyond the boundary of the hole. By revolving this slot about the said given axis, the photocell will then receive a constant amount of light through the slot for every revolved position only if the hole in the member is exactly centered on the given axis. Any off-centering of the hole from this given axis results in a variable amount of light passing to the photocell from the slot. The resulting variable electrical signal derived from the photocell is then used to actuate servo-motors to move the member in a proper direction to minimize the variations in the signal thereby effecting exact centering of the hole and thus the member at the precise coordinate points.

3,716,717
FLAME DETECTOR AND ELECTRICAL DETECTION CIRCUIT

Andreas Scheidweiler, Stafa, and Peter Muller, Oetwil am See, Switzerland, assignors to Gerberus A.G., Mannedorf, Switzerland

Filed May 28, 1971, Ser. No. 147,826
Claims priority, application Switzerland, Apr. 8, 1971, 5,193/71
Int. Cl. G02t 1/28
U.S. Cl. 250—217 F **8 Claims**

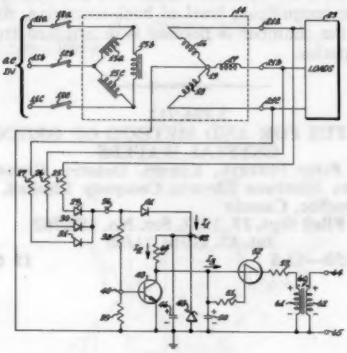
A photoelectric transducer provides signals responsive to a flame; the signals are applied to frequency selective amplifiers, having their frequency ranges of amplification so set that the lower limit of the frequency band of one amplifier is not more than twice the frequency of the upper limit of the other amplifier, preferably each with frequency band width in the order of $\sqrt{2}$, adjacently located, so that harmonics of sensed frequencies are effectively excluded from amplification, while separate amplification channels amplify frequencies of different band width. The overall frequency band width of amplification is preferably between 2 and 40 Hz.



3,716,718
LOSS OF PHASE DETECTOR FOR A POLYPHASE POWER SYSTEM

John R. Nowell, Phoenix, and Luther L. Genuit, Scottsdale, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 3, 1972, Ser. No. 240,608
Int. Cl. H02j 3/00
U.S. Cl. 307—13 **4 Claims**



The improved loss of phase detector employs a plurality of diodes connected between a transistor and a polyphase A.C. power system. A single transistor and a silicon unilateral switch provide an alarm signal when power is lost in any one of the phases of the polyphase system. Few components are used so the cost of the detector is relatively low.

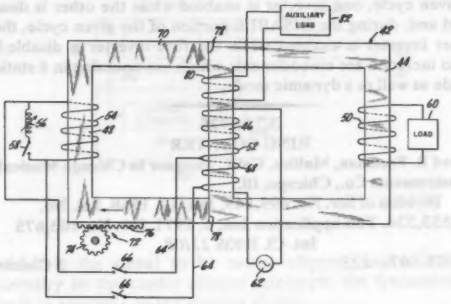
3,716,719
MODULATED OUTPUT TRANSFORMERS

Henry W. Angelery, Closter, N.J., and Glenn R. Mohr, Linthicum, Md., assignors to Aerco Corporation, Northvale, N.J.

Filed June 7, 1971, Ser. No. 150,682
Int. Cl. G05f 3/04
U.S. Cl. 307—17 **8 Claims**

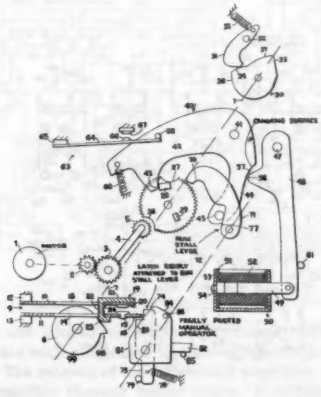
A transformer core has three legs. A variable output secondary winding encircles one leg, and a primary winding encircles another. The voltage across the variable output secondary winding is controlled by varying the amount of leakage flux

passing through the third leg. This can be accomplished by providing a separately formed core piece that is movable to vary its area of contact with the third leg. Alternatively, a control winding can be provided which encircles the third leg. The current induced in the control winding, which is modulated by



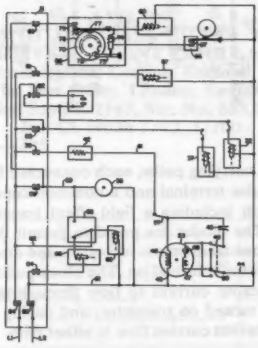
a variable control impedance connected across it, produces a flux that, in proportion to its strength, opposes the primary winding flux, thereby increasing the amount of flux that passes through the secondary winding. A fixed output voltage can be obtained from an additional secondary winding that encircles the same leg as the primary winding.

3,716,720
CONDITION CONTROL DEVICE AND SYSTEM
John L. Harris, Hartland, Wis., assignor to Deltrol Corp., Bellwood, Ill.
Filed April 12, 1971, Ser. No. 133,077
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **8 Claims**



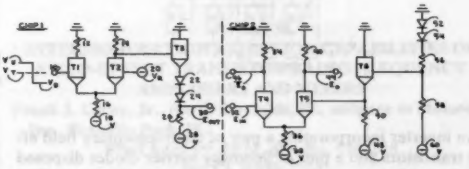
Protection against refrigeration compressor burnout by short cycling is provided by a time delay switching mechanism having a motor and a solenoid controlled by a room thermostat. The motor runs continuously and the solenoid stops and starts the timer by stalling or releasing the timer gear. The timer gear has teeth omitted at the stalling points to allow the motor to run free. A starter cam follower bearing on a starter cam serves to start the timer gear when released by the solenoid. The solenoid operates the stalling and switch control mechanism through a compound leverage and camming system compensating for the non-linear pull curve of the solenoid. The device also includes a combination cam and latch operated switch in which one switch blade carries a follower lifting another blade which is then held by the latch when the follower drops to close the switch. A manual operator is provided for closing the switch independently of the timing mechanism. This manual operator is released automatically by the solenoid dropping out when the thermostat becomes satisfied. The timer also includes an arrangement for locking the compressor switch closed for a period of time when it first closes to allow the system to settle down and thus avoid short cycling.

3,716,721
CONTROL SYSTEM FOR WASHING APPARATUS
Harold F. Gorsuch, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 8, 1971, Ser. No. 160,590
Int. Cl. H02p *3/00*
U.S. Cl. 307—141.4 **9 Claims**



Control for clothes washing machine apparatus incorporating means for extending a predetermined portion of the cycle of operation as desired by the user. The control is further characterized by the provision of a main motor reversing control which along with the cycle extending means is incorporated into what would otherwise by considered a conventional washing machine timer or control.

3,716,722
TEMPERATURE COMPENSATION FOR LOGIC CIRCUITS
Richard W. Bryant, Poughkeepsie, and George K. Tu, Wappingers Falls, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.
Filed Apr. 29, 1970, Ser. No. 32,922
Int. Cl. H03f *1/30;* **H03k** *19/30, 19/34*
U.S. Cl. 307—215 **7 Claims**



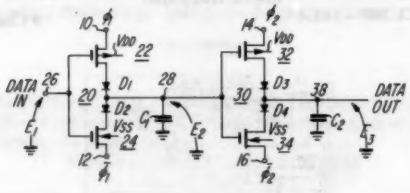
A temperature compensation circuit for an emitter-coupled circuit. Instead of using a fixed reference voltage, the reference voltage is derived from various active devices such that it varies with temperature in the same

manner as the input signal levels vary with temperature. By causing the reference voltage to change in accordance with changes in temperature, it is possible to design circuits which have small signal swings yet interface with each other, and are capable of high switching speeds over relatively large temperature ranges.

3,716,723
DATA TRANSLATING CIRCUIT

Robert Charles Heuner, Bound Brook, and Stanley Joseph Niemiec, Somerville, both of N.J., assignors to RCA Corporation

Filed July 6, 1971, Ser. No. 159,779
Int. Cl. G11c 19/00
U.S. Cl. 307—221 C **8 Claims**

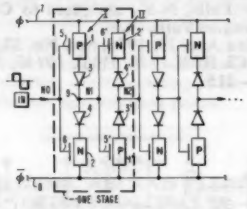


Two current carrying paths, each connected between a different clock pulse terminal and a common capacitive output node, each path including a field-effect transistor in series with a diode. The diodes are poled to permit the node to be charged when one transistor is turned on and discharged when the other transistor is turned on. The clock pulses, during one time interval, cause current to flow through the one of the paths with the turned on transistor, and during the following time interval prevent current flow in either path.

3,716,724
SHIFT REGISTER INCORPORATING COMPLEMENTARY FIELD EFFECT TRANSISTORS

James T. Parrish, Carmel; Dominic P. Spampinato, Ozone Park, and Lewis M. Terman, South Salem, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,496
Int. Cl. G11c 19/00
U.S. Cl. 307—221 C **14 Claims**

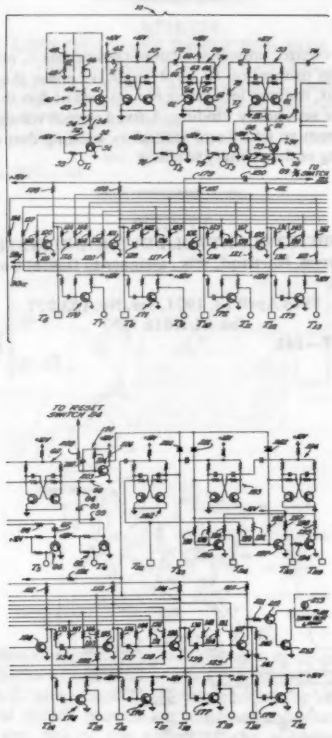


An inverter incorporating a pair of complementary field effect transistors and a pair of Schottky barrier diodes disposed in series with the complementary transistors is disclosed. The gates of the complementary transistors are connected in parallel to a pulsed source which provides positive and negative inputs to the inverter. First and second pulsed sources are connected to the inverter which, during an ENABLE cycle, provide voltages of opposite polarity to the inverter which, operating in a common source mode, charges an output to one of the source potentials. During a DISABLE cycle, the potential at the output is locked at a node by applying to the inverter potentials complementary to those initially applied to the inverter. A shift register stage consisting of the arrangement just described and an inverted inverter is also disclosed. When this shift register stage is actuated, during the ENABLE portion of a given cycle, one inverter is enabled while the other is disabled and, during the DISABLE portion of the given cycle, the other inverter is enabled while the first inverter is disabled. Also included are embodiments which are operable in a static mode as well as a dynamic mode.

3,716,725
RING COUNTER

Alfred B. Freeman, Malibu, Calif., assignor to Chicago Musical Instruments Co., Chicago, Ill.

Division of Ser. No. 699,149, Jan. 19, 1968, Pat. No. 3,553,334. This application Jan. 4, 1971, Ser. No. 103,675
Int. Cl. H03k 23/08
U.S. Cl. 307—223 **3 Claims**



An electronic ring counter driven by a source of pulses and having controls to bypass some of the stages of the ring counter, each stage employing a single transistor.

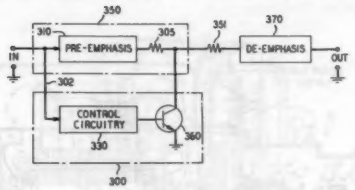
3,716,726
CENTER CLIPPER

David Carlaw Trimble, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed July 13, 1971, Ser. No. 162,155
Int. Cl. H03k 5/08
U.S. Cl. 307—237 **9 Claims**

In a low distortion center clipper, comparator circuitry including two differential amplifiers provides a control

signal when the instantaneous magnitude of the signal to be center clipped lies within the clipping range. The center clipper is coupled to a transmission path, the input to



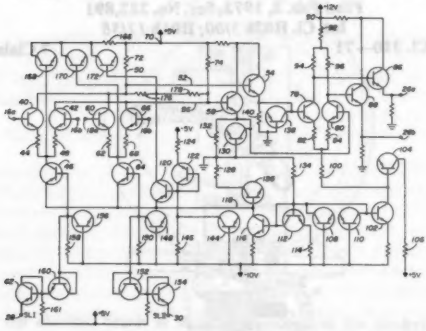
which is the signal to be center clipped, and switching circuitry in the center clipper interrupts the transmission path in response to the control signal.

3,716,727

SWITCHED AMPLIFICATION SYSTEM HAVING RADIATION COMPENSATION CIRCUITRY

Robert A. Stehlin, and Hilton W. Spence, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1969, Ser. No. 888,393
Int. Cl. H03k *17/00*
U.S. Cl. 307—243 **16 Claims**



First and second radiation-compensated differential amplifiers are each connected to receive different low level input signals. The outputs of the differential amplifiers are fed into a third amplifier through buffer stages. Switching circuitry is provided to selectively actuate either of the first or second amplifiers to exclusively feed signals into the third amplifier.

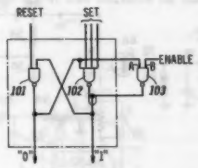
3,716,728

MINIMUM DELAY DATA TRANSFER ARRANGEMENT

Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Oct. 12, 1970, Ser. No. 79,976
Int. Cl. G11c *19/00*; H03k *3/286*
U.S. Cl. 307—291 **5 Claims**

A register structure for a data processor comprising a plurality of multibit flip-flop registers interconnected by means of a data transfer bus is disclosed. The bus comprises a plurality of individual conductors, each individual conductor interconnecting flip-flops similarly situated in each of the plurality of registers. An input gating arrangement for gating data into the flip-flops provides for a transfer of data with minimum delay.

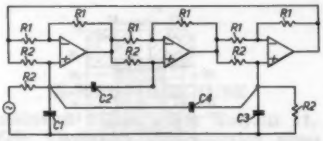


3,716,729

ALL-PASS AND LOW-PASS FILTER COMPRISED OF ACTIVE ELEMENT CIRCULATORS

John Mortimer Rollett, London, England, assignor to The Post Office, London, England

Filed Sept. 8, 1969, Ser. No. 855,879
Int. Cl. H03h *7/02, 11/00*
U.S. Cl. 307—295 **13 Claims**



This specification discloses the use of a circulator having at least three ports for the simulation of networks which in their normal realisations include one or more inductive elements. Various circuit arrangements are described including one or more capacitors connected in respective paths between different pairs of ports of the circulator and possibly also including one or more capacitors connected from ports of the circulator to ground, input and output ports of the circuits being connected to ports of the circulator. Depending on the different connections of the capacitors of the circulator low-pass and all-pass filters of various orders can be produced. The use of the invention has the advantage that the filters can be produced without the incorporation of physical inductors which is of importance in the realisation of the filters in micro-circuit form.

3,716,730

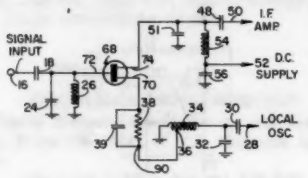
INTERMODULATION REJECTION CAPABILITIES OF FIELD-EFFECT TRANSISTOR RADIO FREQUENCY AMPLIFIERS AND MIXERS

Frank J. Cerny, Jr., North Riverside, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 19, 1971, Ser. No. 135,278
Int. Cl. H03k *1/16*
U.S. Cl. 307—295 **9 Claims**

Mixers and amplifier circuits are disclosed which may include a plurality of identical FETs connected in parallel to form a composite FET. The decreased input impedance of the composite FET as compared to the input impedance of a single FET results in a decrease in intermodulation. The com-

posite FET may also be a power or large signal FET. In either case, the pinch-off voltage of the composite FET can also be



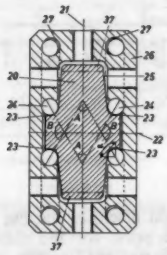
increased to provide a still further decrease in intermodulation.

3,716,731

ARRANGEMENT FOR RECTILINEAR GUIDING OF A MACHINE MEMBER ALONG A BEAM

Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Co. N. V., Overtoom, the Netherlands

Filed July 19, 1971, Ser. No. 163,587
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **6 Claims**



In a rectilinear guiding, a machine member being moveably supported on recirculating balls along a straight guide, said guide being designed as a beam, the cross sectional structure of which giving a high resistance to bending in all directions. Angular contact ball tracksbeing formed in machine member and beam, which latter is designed with ramps forming tangents to said tracks and smoothly sloping away therefrom in order to give the balls a smooth operation at the entry to and the egress from the loaded zone. The beam may preferably be composed by a compound material and serve as an active part of an electric linear motor being attached to the machine member.

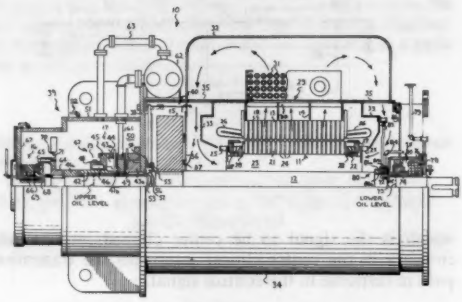
3,716,732

VERTICAL INDUCTION MOTOR

James Earl Tillma, Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 21, 1970, Ser. No. 73,767
Int. Cl. H02k *9/00*
U.S. Cl. 310—61 **6 Claims**

A vertical induction motor is described characterized by a rotor, a single flywheel, a double acting thrust bearing and an anti-reverse device sequentially mounted along the motor shaft. A partition serves to separate the double acting thrust bearing from the flywheel and the thrust bearing is enclosed within a housing which encompasses an oil reservoir in association with a sleeve concentrically mounted between the motor shaft and the thrust bearing. In the event of minor leakage, oil between the sleeve and the shaft is removed by centrifugal action at a shoulder situated along the shaft and the oil is collected in a centrifugal seal having an upwardly protruding annular lip proximate the motor shaft. A second partition also is disposed between the rotor and the flywheel to restrict contact between the flywheel and air circulating



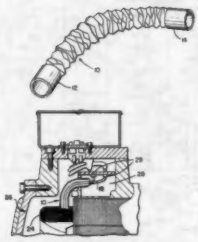
within the rotor except at selected apertures disposed radially inward of the partition. Circulating air thus flows in a first radially inward direction on one side of the partition free from interference with the rotating flywheel while flowing in an opposite direction on the other side of the partition proximate the flywheel.

3,716,733

ELECTRIC MOTOR WITH CORRUGATED PLASTIC PROTECTIVE COVERING ON THE LEAD WIRES

M. Robert Keith, 205 Bristol Road, St. Louis, Mo., and Richard C. Barnes, 5019 Derby Lane, Indianapolis, Ind.

Filed Feb. 2, 1972, Ser. No. 222,891
Int. Cl. H02k *5/00*; H01b *17/58*
U.S. Cl. 310—71 **7 Claims**



Electrical lead wires, for example, from the stator of a hermetically sealed electric motor to a junction box are encased in a corrugated sheath of polyethylene terephthalate. The corrugations effectively increase the spacing between the primary insulation on the lead wires and regions of potential insulation abrasion and wear on the stator laminations or the compressor casing.

3,716,734

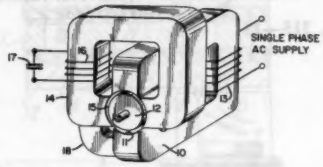
PARAMETRIC MOTOR

Wagih Zaki Fam, Halifax, Nova Scotia, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Oct. 18, 1971, Ser. No. 189,886
Int. Cl. H02k *11/00*
U.S. Cl. 310—72 **3 Claims**

An alternating current electric motor having a rotor, a first magnetic structure defining a first magnetic circuit, a second magnetic structure defining a second magnetic circuit, said first and second magnetic circuits

including the said rotor in their magnetic paths, said first and second magnetic structures each having portions generally at right angles to each other, a first winding on said first structure and connected for energization from an alternating current single phase supply, a second winding



on the said second structure connected to a capacitor to form a closed electrical circuit, said first and second windings positioned in space such that the second winding is excited parametrically from the first winding producing a flux in the second structure 90° out of phase with the first.

3,716,735

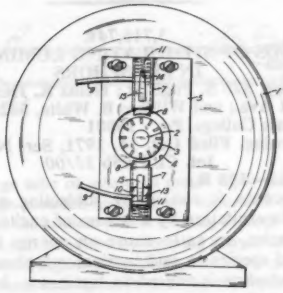
ELECTRICAL BRUSH ASSEMBLY

William L. Dippold, St. Marys, Pa., assignor to Stackpole Carbon Comapny, St. Marys, Pa.

Filed Aug. 25, 1971, Ser. No. 174,690

Int. Cl. H02k *13/00*

U.S. Cl. 310—240 **3 Claims**



An electric brush is slidably disposed in the socket of a holder, with a spring compressed between the inner ends of the brush and socket. The side of the brush has a recess near its inner end beside an opening in the holder. Extending into this recess is the free end of a tongue that is joined to the holder to hold the brush retracted against the pressure of the spring. A similar brush arrangement is spaced far enough from the one just described for an armature or the like to be inserted between the brushes without touching them. Then the tongues are bent out of the brush recesses so that the springs can expand and move the brushes into engagement with the armature.

3,716,736

ELECTRON DISCHARGE DEVICE

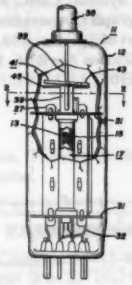
Walter T. Millis, Owensboro, N.Y., assignor to General Electric Company

Filed Oct. 2, 1958, Ser. No. 764,988

Int. Cl. H01j *1/02*

U.S. Cl. 313—39 **17 Claims**

7. A high-power electron discharge rectifier, comprising an anode and a cathode supported in spaced relation thereto, said anode comprising a substantially cylindrical member of plural-layer material defining a barrel portion generally enclosing said cathode and a pair of free ends, said plural-layer material comprising at least one layer of high heat conductivity material disposed to form the surface of the barrel nearer



said cathode, whereby to facilitate conductive cooling of said anode and thus to minimize formation of hot spots thereon, and means joining said ends in juxtaposed relation over a portion thereof to define a web, the remote end portions being outwardly flared to provide oppositely extending wings.

3,716,737

X-RAY PULSE TUBE

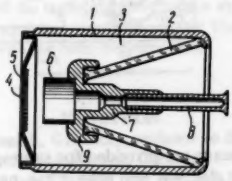
Nikolai Vasilievich Belkin, ulitsa Tolyatti 11, kv. 39; Eduard-Gfly Vitalievich Alexandrovich, ulitsa Pobedy 19, kv. 10; Anatoly Alexandrovich Razin, ulitsa Lenina 32, kv. 16; Mikhail Alexeevich Kanunov, ulitsa Pushkina 26, kv. 11; and Veniamin Aronovich Tsukerman, ulitsa Vavilova 15, kv. 75, all of Moscow, U.S.S.R.; and Galina Nikolaevna Sloeva, prospekt Narodnogo Opolchenia 177, kv. 62; Leonard Vasilievich Svetkov, prospekt Slavy 20, kv. 119; and Ninel Alexeevna Dron, Kostromskoi prospekt 22, kv. 71, all of Leningrad, U.S.S.R.

Filed Mar. 17, 1971, Ser. No. 125,031

Claims priority, application U.S.S.R., Mar. 23, 1970, 1,418,567

Int. Cl. H01j *19/42*

U.S. Cl. 313—59 **1 Claim**



An X-ray pulse tube wherein the envelope is so designed that the insulation element which is one of the structural components of the tube envelope is completely disposed inside, and is connected to the inner surface of the metal element which is the other structural component of the

envelope, which makes it possible to reduce the size of the tube, improve its mechanical and electrical strength and increase the intensity of X-ray flashes.

3,716,738

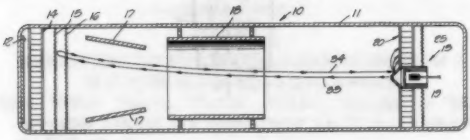
TELEVISION CAMERA TUBE HAVING CHANNEL MULTIPLIER SURROUNDING ELECTRON GUN

Johann Battesta Beeli, Sylmar, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 850,749, Aug. 18, 1969, abandoned. This application April 26, 1971, Ser. No. 137,636

Int. Cl. H01j *31/28, 31/32, 43/24*

U.S. Cl. 313—65 R **4 Claims**



A television camera type tube including a target and an electron gun for producing an electron beam to scan the target. The scanning beam causes a return beam to be produced. A channel-type secondary electron multiplier is located near the gun end of the tube to receive electrons in response to the electrons moving in the return beam.

3,716,739

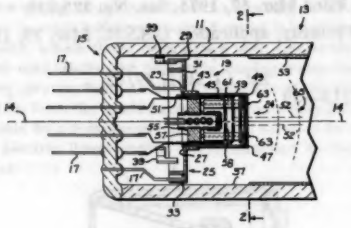
ELECTRON GUN SUPPORT AND SHIELDING MEANS

Donald L. Say, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated

Filed Aug. 31, 1971, Ser. No. 176,503

Int. Cl. H01j *29/02, 1/92*

U.S. Cl. 313—82 R **2 Claims**



Improved means are provided for supporting and shielding a compact electron gun within the neck portion of a cathode ray tube. An annular member, dimensioned to closely approach the internal diameter of the neck, is formed for attachment to at least three spaced-apart stem leads. An open-ended closed-wall portion, upstanding from the central aperture of the annular member, is dimensioned to encompass the whole of the electron gun therein. Gun retention means are employed to hold the gun within the closed-wall portion in a manner that the forward end of the gun is positioned at the terminal thereof.

3,716,740

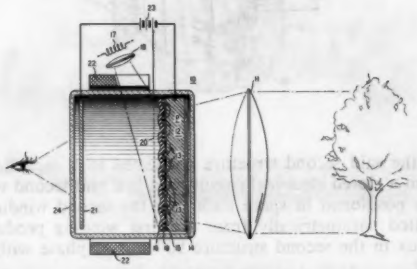
PHOTOCATHODE WITH PHOTOEMITTER ACTIVATION CONTROLLED BY DIODE ARRAY

Merton Howard Crowell, Morristown, and Eugene Irving Gordon, Convent Station, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 18, 1970, Ser. No. 73,490

Int. Cl. H01j *31/48*

U.S. Cl. 315—11 **5 Claims**



The specification describes a new type of photocathode comprising a semiconductor diode-array light sensing element in combination with a photoemissive coating. The spatial pattern of electron emission from the photoemitter is controlled by the localized field in the diode array. The local intensity of this field gives a spatial representation of the image incident on the diode array. With a silicon diode array infrared and X-ray response are inherent.

3,716,741

METHODS OF STIMULATING LUMINESCENCE IN PHOSPHORS

Rustum Roy, 528 S. Pugh St.; Heinz K. Henisch, 346 W. Hillcrest Ave.; and William B. White, 542 Glenn Road, all of State College, Pa. 16801

No Drawing. Filed Oct. 15, 1971, Ser. No. 189,765

Int. Cl. H05b *33/00*

U.S. Cl. 313—108 R **13 Claims**

Luminescence is caused by subjecting a luminescent phosphor to excitation by a stream of excited, electrically neutral species, so as to cause an energy transfer from said excited species to said luminescent phosphor, whereby said phosphor is caused to luminesce. In a preferred embodiment, the neutral species is OH*, and the phosphor is a rare earth oxide phosphor containing a terbium oxide or europium oxide activator.

3,716,742

DISPLAY DEVICE UTILIZATION GAS DISCHARGE

Norihiko Nakayama, Kobe, and Mitsuoki Osawa, 641-1-1, Okubomachi, Okubo-cho, Akashi-shi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed March 2, 1971, Ser. No. 120,284

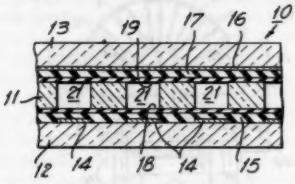
Claims priority, application Japan, March 3, 1970, 45/18213; Dec. 29, 1970, 45/128634

Int. Cl. H01j *61/36*

U.S. Cl. 313—182 **7 Claims**

A pair of insulating substrates are positioned in spaced parallel relation having inside surfaces opposite each other with a gap filled with gas capable of ionization. A first group of electrodes are positioned on the inside surfaces of one of the substrates, and a second group of electrodes are positioned on the inside surfaces of the other of the substrates. The first group of electrodes are positioned in rows and the second group of electrodes are positioned in columns, and the first and second groups of electrodes are transversely positioned relative to each other. The surfaces of the first and second groups of electrodes are covered with dielectric layers, and

each of the dielectric layers is covered with a protective layer to protect the surfaces inside the display device from sputtering. Each cross point of an electrode of the first group and an electrode of the second group is a discharge point for display.

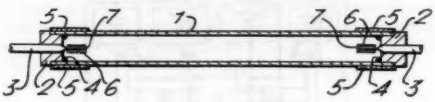


3,716,743

HIGH-PRESSURE METAL-VAPOR DISCHARGE TUBE

Hideo Mizuno; Sadao Kimura, both of Takatsuki; Hidezo Akutsu, Ashiya; Haruo Yamazaki, Yasu-gun; Takio Okamoto, Kusatsu; Yoshiaki Watarai, and Shoichi Baba, both of Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma City, Osaka Prefecture, Japan

Filed Aug. 28, 1970, Ser. No. 67,691
Claims priority, application Japan, Aug. 29, 1969, 44/69487
Int. Cl. H01j *17/16*
U.S. Cl. 313—220 10 Claims



In a discharge tube of saturated metal vapor pressure type containing high-pressure gaseous or vaporized metals, the temperature of the coolest points existing at both ends of the discharge tube can be raised by forming a layer or layers of a metal or metals of high melting point, low vapor pressure and good thermal conductivity, such as niobium, on the outer wall at the ends of the discharge tube; thereby, providing better radiant emission, especially higher color temperature and an improved color rendering property compared with conventional high-pressure metal-vapor discharge tubes. The discharge tube of the above-mentioned construction can be manufactured easily and has a longer life under burning conditions corresponding to those for conventional type high-pressure metal-vapor discharge tubes.

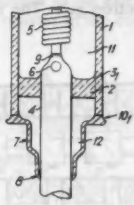
3,716,744

HERMETIC END SEALS FOR ENVELOPE OF A METAL VAPOR LAMP

Andre Emile Delembre, Asineres, France; Georges Roger Jarrige, deceased, late of Bagneux, France; by Jeanine Jarrige, administratrix, Germain Sucy-en-Brie, and Dat Nhiep Nguyen, Chatenay-Malabrey, both of France, assignors to ITT Industries, Inc., New York, N.Y., by said Delembre and Nguyen

Filed Aug. 13, 1971, Ser. No. 171,578
Claims priority, application France, Aug. 27, 1970, 7031286
Int. Cl. H01j *61/30, 61/36*
U.S. Cl. 313—220 6 Claims

An alkali-metal-vapor discharge lamp has an inner vitreous material hermetic seal between an electrode stem and translucent tubular envelope and an outer metal seal between a metal end cap and the envelope. The cap is also sealed to the stem which extends from the tube.



ERRATUM

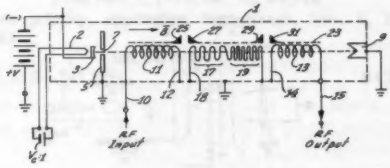
For Class 315—11 see:
Patent No. 3,716,740

3,716,745

DOUBLE OCTAVE BROADBAND TRAVELING WAVE TUBE

Robert Matthews Phillips, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed July 22, 1971, Ser. No. 165,263
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.6 18 Claims



An O-type traveling wave tube of the invention includes a slow wave structure having a broad band characteristic over a predetermined range of frequencies and in some cases is capable of broad band operation over a double octave of frequencies. In this the slow wave structure comprises a combination of a substantially nondispersive delay line, such as a helix, with a substantially dispersive delay line, such as a ring loop section. The ring loop sections complement in gain the gain drop off characteristic of the helix at the edges of the frequency band at which the gain from the helix circuit tapers off. In this the overall gain of the traveling wave tube is enhanced and extended over a frequency spectrum greater than that which is available solely with the helix construction.

3,716,746

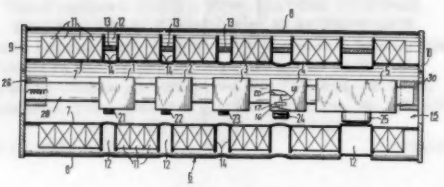
KLYSTRON

Artur Kraus, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 22, 1971, Ser. No. 165,100
Claims priority, application Germany, July 24, 1970, P 20 36 942.0
Int. Cl. H01j *23/08*
U.S. Cl. 315—5.35 6 Claims

This invention provides an improvement in a Klystron tube assembly including a tube portion installed within an assembled magnetic system, the tube portion having several chambers each of which contains interaction sections and vacuum-closed coupling openings from which coupling conductors can

be extended to the exterior of the Klystron, the chambers being arranged between an electron gun and an electron collector, and the surrounding magnetic system producing an axial magnetic field directed essentially parallel to the axis of the beam of the electron gun. The improvement comprises



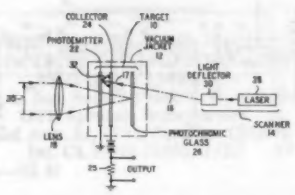
recesses arranged in the magnetic system so that coupling conductors can be shifted therein to be perpendicular to the axis of the electron beam and means arranged on the chambers to have the coupling conductors attached thereto in a manner whereby the tube portion can easily be withdrawn from and inserted into the magnetic system.

3,716,747

TELEVISION CAMERA TUBE UTILIZING LIGHT BEAM SCANNING

Chandra Kumar Naranbhai Patel, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 4, 1970, Ser. No. 69,539
Int. Cl. H01j *29/46*
U.S. Cl. 315—10 **11 Claims**



The target of a television camera tube includes a photoemitter or a photoconductor and a photochromic glass layer disposed between an image being viewed and the source of a scanning laser beam. The image is focused onto one surface of the photochromic glass layer while the scanning beam is made incident on the opposite surface thereof. The beam transmitted through the layer emerges with modulated intensity corresponding to the intensity pattern of the image and then impinges on the photoemitter, for example, to generate free electrons modulated in scan time in accordance with the image intensity pattern. These electrons are collected to produce an electrical signal representative of the image.

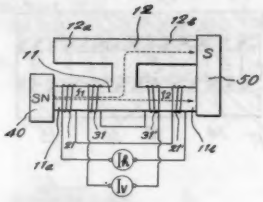
3,716,748

SATURABLE REACTOR FOR CORRECTING RASTER DISTORTION

Takeyoshi Sohoma, Funabashi, Chiba Prefecture, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed July 29, 1970, Ser. No. 59,155
Claims priority, application Japan, July 24, 1969, 44/73474
Int. Cl. H01j *29/76*
U.S. Cl. 315—27 SR **5 Claims**

A saturable reactor comprising an H-shaped core on which are wound two coils, each coil being divided respectively into two coil parts and each coil part being constituted of symmetrical winding on the left and right arms of a yoke with the coupling part formed on the middle of the aforementioned core as the center. One of the aforementioned coils is constituted so that the magnetic flux generating direction of the



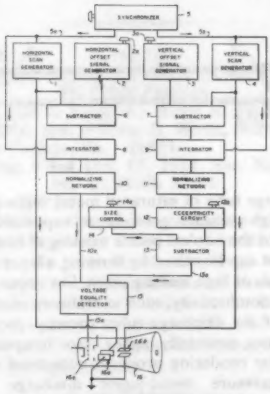
pair of coil parts wound on the yoke mentioned above would be identical, while the other coil mentioned above is constituted so that the magnetic flux generating direction of the pair of coil parts wound on the yoke mentioned above would be mutually opposite.

3,716,749

DISPLAY SYSTEM TO GENERATE SYMBOLS FORMED OF CONIC SECTIONS

Kenneth G. Colby, Barboursville, and Robert F. Riggs, Charlottesville, both of Va., assignors to Sperry Rand Corporation

Filed Dec. 7, 1970, Ser. No. 95,739
Int. Cl. H01j *29/70*
U.S. Cl. 315—23 **11 Claims**



Apparatus for generation of symbols on the screen of a cathode ray tube is disclosed featuring integration of the electron beam scanning potentials, signal normalization, and voltage equality detection of the integrated signals to generate, according to the adjustment of biasing controls, symbols formed of conic sections locatable in any position on the screen for navigation, identification, or other purposes.

3,716,750

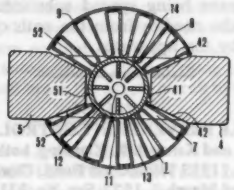
MAGNETRONS

Kusuo Nakada, 13 Machibo, and Tomokatsu Oguro, 3550 Hayano, both of Mobara-shi, Japan

Filed May 12, 1971, Ser. No. 142,641
Claims priority, application Japan, May 30, 1970, 45/46034
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.71 **9 Claims**

In a magnetron device of the class comprising a magnetron tube, permanent magnets on radially opposite sides of the magnetron tube yoke means for applying a magnetic field

across the magnetron tube, and cooling means surrounding the magnetron tube and at least a portion of the permanent



magnets, the widths of the permanent magnets being gradually decreased toward the magnetron tube thus forming tapered side surfaces.

3,716,751

STARTER DEVICE FOR A DISCHARGE LAMP

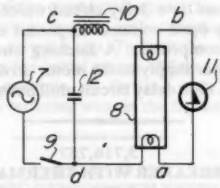
Toru Takei, Higashinari-ku, Osaka; Yasutaka Kawai, Higashiosaka-shi, and Takeshi Matsushima, Nara-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Claims priority application Japan, May 21, 1968, 43/35240; May 17, 1968, 43/33451; May 21, 1968, 43/35241; May 24, 1968, 43/35853; May 24, 1968, 43/43740

Filed May 5, 1969, Ser. No. 821,611

Int. Cl. H05b *41/16*

U.S. Cl. 315—106 9 Claims



A starter device for a discharge lamp instantaneously lighting a preheating type fluorescent discharge tube where in parallel to the said fluorescent discharge tube is connected a reverse blocking diode thyristor, the breakover voltage being lower than the maximum value of the rated voltage of the power source but higher than the discharge voltage of the said fluorescent discharge tube while the blocking voltage being sufficiently larger than the said breakover voltage.

3,716,752

ELECTRONIC FLASH INTENSITY CONTROL CIRCUITS

Hiroshi Iwata, Joto-ku, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

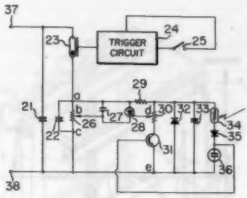
Filed Oct. 16, 1970, Ser. No. 81,349

Claims priority, application Japan, Oct. 20, 1969, 44/84072; Oct. 20, 1969, 44/84073; Oct. 20, 1969, 44/84074

Int. Cl. H05b *41/40*

U.S. Cl. 315—151 6 Claims

Electronic flash intensity control circuits for controlling the light output of a discharge tube, comprising a first capacitor having a stored energy, a trigger circuit connected operatively to the discharge tube for causing the discharge tube to operate and thereby the discharge of said first capacitor to initiate, a series circuit of a resistor and the discharge tube connected in parallel with the first capacitor for consuming a part of the stored energy in the first capacitor, a semiconductor control element having an anode, a cathode and a gate and connected in parallel with the resistor for being rendered conductive at a desired time so as to control the output of the discharge tube, and means connected to the semiconductor control element for applying a control voltage to the gate thereof, wherein the terminal voltage of the resistor in the course of the discharge



of the first capacitor is divided by a suitable dividing ratio, one of the divided voltages is applied between the cathode and the gate of the semiconductor control element, and the one divided voltage and the control voltage are compared with each other to cause the semiconductor control element to conduct at the desired time.

3,716,753

ARRANGEMENT INCLUDING AN ELECTRONIC FLASH TUBE

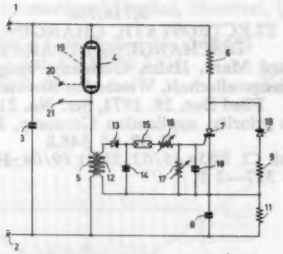
Emil August Exner, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,516

Claims priority, application Netherlands, Nov. 8, 1969, 6916883

Int. Cl. H05b *37/00*

U.S. Cl. 315—241 P 9 Claims



The invention relates to an arrangement including an electronic flash tube which is fed from a previously charged main capacitor.

In a known arrangement a so-called quench tube is arranged across the flash tube. This quench tube is ignited when sufficient light energy is emitted by the flash tube. A drawback of the known arrangement is that the main capacitor becomes completely discharged when this quench tube is ignited.

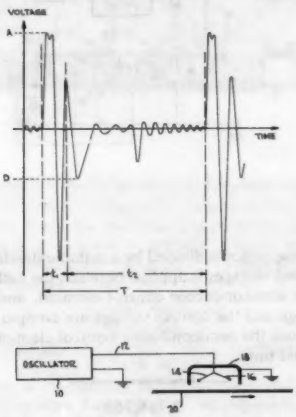
The invention provides a solution in which the shunt across the flash tube also includes a capacitor. The result of this simple step is that the main capacitor is not completely discharged. This has the advantage that the capacitor can be recharged rapidly again for taking the next flash photograph and that the device serving for the supply of this main capacitor is less rapidly exhausted.

3,716,754

METHOD AND APPARATUS FOR DE-ELECTRIFYING INSULATIVE MATERIALS

Guy Paul Weber, 25 Rue Verdier Monetti, 76 Arques la Bataille, France, and Philippe Marie Deshayes, Avenue des Canadiens, 76 Neuville les Dieppe, France

Filed Sept. 10, 1971, Ser. No. 179,339
Int. Cl. H01t 19/00; H05f 3/00
U.S. Cl. 317—2 F 17 Claims



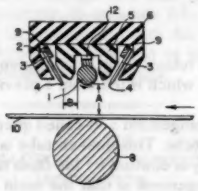
Method and apparatus for de-electrifying insulative material moving past ionizing electrodes by supplying a de-electrifying waveform having an ionization portion and a damped portion to the ionizing electrodes. The ionization portion of the de-electrifying waveform includes alternate polarity pulses having an amplitude to ionize a gaseous medium surrounding the ionizing electrodes, and the damped portion of the de-electrifying waveform has an amplitude insufficient to ionize the gaseous medium.

3,716,755

ELECTROSTATIC CHARGING AND DISCHARGING APPARATUS

Gerhard Marx, Hahn, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 28, 1971, Ser. No. 212,993
Claims priority, application Germany, Dec. 30, 1970, P 20 64 545.8
Int. Cl. E03g 15/02; H01t 19/04; H05f 3/00
U.S. Cl. 317—2 F 7 Claims



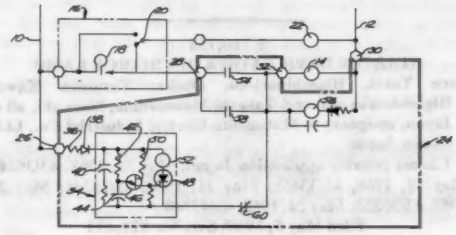
This invention relates to an apparatus for the electrostatic charging or discharging of the surface of web or sheet-like material, especially the electrostatic charging of photoconductive insulating layers, said apparatus including a charge-absorbing electrode in the form of a rotatable roller means with a roughened surface, said roller means being partially surrounded by an insulator and located between pointed corona electrodes in the form of a series of closely spaced needles which are externally protected by a second insulator, the outer extremity of the said roller means being spaced substantially equally to the points of the needles from the path of a material to be processed by the apparatus.

3,716,756

RECYCLE PREVENTION CONTROL CIRCUIT

John N. Runge, and Kenneth R. Krusling, both of c/o R-K Electric Co., Inc., 11315 Williamson Road, Cincinnati, Ohio

Filed March 3, 1972, Ser. No. 231,668
Int. Cl. H02h 7/085
U.S. Cl. 317—13 A 8 Claims



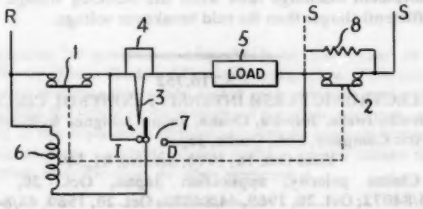
Timed control for preventing recycling of an electric motor drive compressor after a power interruption. It includes a solid-state pre-set time delay circuit which, upon timing out, closes normally open contacts to permit energization of the motor driven compressor. A latching circuit automatically locks in the power supply to the motor driven compressor and deenergizes the time delay circuit until power is interrupted.

3,716,757

CIRCUIT BREAKER WITH THERMAL TRIPPING DEVICE

Arturo Perez Rodriguez, 2 rue General Moscardo, Madrid, Spain

Filed Feb. 3, 1972, Ser. No. 223,098
Claims priority, application Spain, Feb. 6, 1971, 388017; June 16, 1971, 392343
Int. Cl. H02h 5/04
U.S. Cl. 317—40 R 7 Claims



A circuit breaker actuated automatically electrically for interrupting current supply from a multiphase circuit to a load accomplished by a series overcurrent tripping device. An operating coil of the main circuit interruptor has one terminal connected to one phase of the power circuit and its other terminal connected to a movable control contact in a control circuit connected to the other phase of the power circuit. The overcurrent tripping device is a bimetallic device that functions as a thermal tripping device functioning to actuate the

control contact to a position closing the control circuit to energize the operating coil and interrupt the main circuit supply to the load when an overload or short circuit obtains. When the overload or short circuit is removed the bimetallic device cools and the control contact, which is biased to a rest position breaking the control circuit, is restored automatically to its rest position so that the main circuit interruptor is deenergized and automatically allows closing of its main contacts that make-and-break the supply circuit to the load.

3,716,758

THYRISTOR IGNITION CONTROL DEVICE

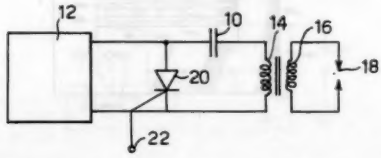
Mario Palazzetti, Avigliana, Italy, assignor to Fiat Sosieta per Azioni, Turin, Italy

Filed March 10, 1972, Ser. No. 233,634

Claims priority, application Italy, March 12, 1971, 67866 A/71

Int. Cl. F23g *3/00*

U.S. Cl. 317—96 **2 Claims**



A thyristor ignition control device for internal combustion engine ignition circuits. A capacitor is charged from a voltage source and discharges through the primary of a step-up transformer when a thyristor connected across the source is fired, producing a high voltage impulse at the transformer secondary to induce sparking across a gap. To limit the current through the thyristor during the initial stages of firing the transformer has a core, for example of ferrite, with a high initial reluctance, thereby reducing wear in the thyristor.

3,716,759

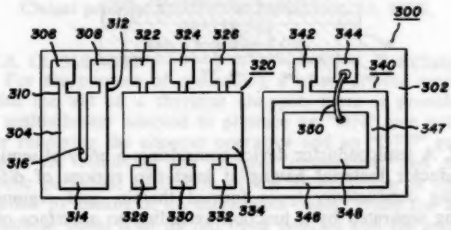
ELECTRONIC DEVICE WITH THERMALLY CONDUCTIVE DIELECTRIC BARRIER

Robert I. Scace, Skaneateles, and Glen A. Slack, Scotia, both of N.Y., assignors to General Electric Company

Continuation-in-part of Ser. No. 843,533, July 22, 1969, Pat. No. 3,609,411. This application Oct. 12, 1970, Ser. No. 79,918The portion of the term of this patent subsequent to Sept. 28, 1988, has been disclaimed.

Int. Cl. H01l *1/12*

U.S. Cl. 317—100 **12 Claims**



An electronic device is provided with an active portion which generates heat as a result of internal power losses, such as a semiconductor element, a resistor, a capacitor, etc. The active portion is mounted in thermally conductive relation with a substrate comprised of a unitary layer consisting essentially of aluminum nitride. The aluminum nitride may be in the form of a single crystal or may be polycrystalline.

3,716,760

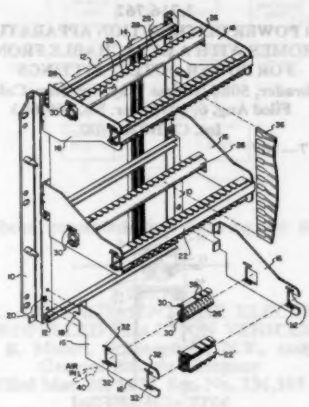
PRINTED WIRING CARD SHELF

Ansano Bertellotti, 13 Elizabeth Lane, Addison, Ill., and Robert F. Thayer, 35131 Cypress, Glen Ellyn, Ill.

Filed April 27, 1972, Ser. No. 248,277

Int. Cl. H02b *1/02*

U.S. Cl. 317—101 DH **7 Claims**



There is herein disclosed a printed wiring card file including a front support formed of a rectangular tubular member having a slotted steel card guide on its top and bottom surfaces and a rear support formed of a circular tubular member having a slotted card guide at the top and bottom. The front card guide slots are so shaped as to align a wiring card horizontally with the rear card guide slots while the rear support member serves to vertically align the wiring card during insertion.

3,716,761

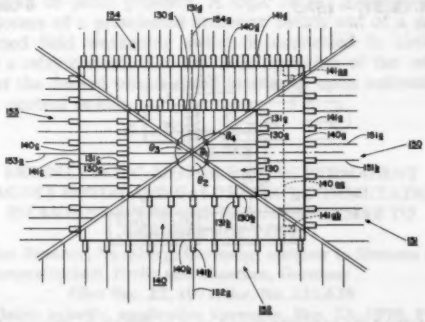
UNIVERSAL INTERCONNECTION STRUCTURE FOR MICROELECTRONIC DEVICES

Nikita L. Rotast, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada

Filed May 3, 1972, Ser. No. 249,833

Int. Cl. H05k *1/04*

U.S. Cl. 317—101 B **17 Claims**



The invention relates to a lead structure—particularly a beam-lead frame or pattern deposited upon a substrate—which will accommodate devices having shapes and contact configurations according to a given standard. For example, in one embodiment of the invention, the

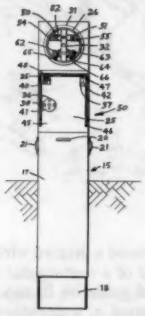
lead structure will accommodate all devices formed according to the EIA JC11.4 standard. The structure is not limited to triangular or rectangular devices but may be patterned to accommodate families of polygonal chips having any number of sides, providing all chips to be accommodated by any given pattern according to the invention comply with certain defined standards.

3,716,762

METER POWER DISTRIBUTION APPARATUS FOR MOBILE HOMES WITH A DETACHABLE FRONT PANEL FOR POWER OUTLET FITTINGS

Delworth Shrader, 5088 Nerissa Way, San Jose, Calif.

Filed Aug. 6, 1971, Ser. No. 169,643
Int. Cl. H02b 9/00
U.S. Cl. 317—107 11 Claims



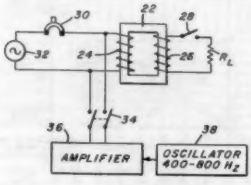
A meter power distribution apparatus in which anchor clips are connected to the meter line side of the watt-hour meter and anchor clips are connected to the load line side of the watt-hour meter.

3,716,763

METHOD FOR REDUCING CORE LOSSES IN SILICON STEELS AND THE LIKE

Gerald L. Houze, Jr., Sarver, and Merlin L. Osborn, Saxonburg, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1971, Ser. No. 213,585
Int. Cl. H01f 13/00
U.S. Cl. 317—157.5 6 Claims



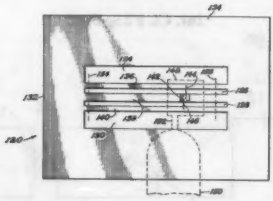
Method for reducing core losses in silicon steels and other similar materials having antiparallel domain wall structures by applying high frequency (e.g., 400–800 Hz.) oscillatory wave energy to a winding surrounding a transformer or other device using the steel or the like as a core material. Following a power surge experienced by the transformer or other electrical apparatus, the number of domain walls is reduced, increasing core losses. By applying a pulse of high frequency wave energy following the surge and at a flux density preferably in excess of 15,000 gauss, the number of domain walls can again be increased to reduce core losses.

3,716,764

PROCESS FOR ENCAPSULATING ELECTRONIC COMPONENTS IN PLASTIC

Robert O. Birchler, Dallas, Tex., and E. R. Williams, Jr., Scottsdale, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original application Dec. 16, 1963, Ser. No. 331,006, now Patent No. 3,439,238, dated Apr. 15, 1969. Divided and this application Oct. 17, 1968, Ser. No. 768,325
Int. Cl. H01l 1/02
U.S. Cl. 317—234 24 Claims



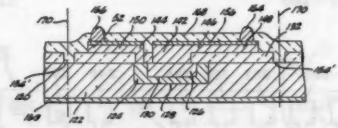
A method of making contacts to a semiconductor device and encapsulating the device, and the resulting device. A frame having inwardly-extending conductor strips is used to support the assembly during the steps of mounting a semiconductor wafer on one of the strips, connecting conductive wires from electrodes on the wafer to other strips and molding a plastic package around the device. The frame is then severed.

3,716,765

SEMICONDUCTOR DEVICE WITH PROTECTIVE GLASS SEALING

Harold F. Rueffer, Costa Mesa, and Richard J. Belardi, Anaheim, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Original application Mar. 14, 1966, Ser. No. 534,135, now Patent No. 3,514,848. Divided and this application Dec. 23, 1969, Ser. No. 889,814
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 1 Claim



1. A semiconductor device comprising: a body of semiconductor material having at least two regions of differing conductivity types formed therein, said regions being separated by a junction extending to a surface of said semiconductor body, a layer of an oxide of said semiconductor material disposed over a substantial portion of said surface, a layer of glass disposed over said oxide layer and extending beyond the entire perimeter of said oxide layer, said glass layer contacting a portion of said surface of said semiconductor body extending beyond said entire perimeter and being sealed to said portion of said semiconductor body, and electrically conductive

means extending through said glass and said oxide layers for making electrical contact with at least one of said regions.

3,716,766

COOPERATIVE SYSTEM OF WINDSHIELD WASHER AND WIPER WITH INTERMITTENT WIPER OPERATING MECHANISM

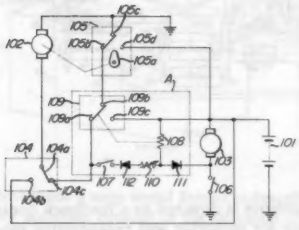
Motoji Suzuki, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya-ski, Aichi-ken, Japan

Filed Dec. 15, 1971, Ser. No. 208,097

Claims priority, application Japan, Dec. 17, 1970, 45/126674; June 3, 1971, 46/46572

Int. Cl. H02p *1/58*; B60s *1/02*

U.S. Cl. 318—102 **13 Claims**



A system for cooperatively operating a windshield washer and a windshield wiper is provided which comprises a washer motor connected in series with a washer switch, a heating wire connected in parallel with said washer motor, a temperature responsive switch connected between a wiper motor and a power source and adapted to operate with a thermal time delay provided by said heating wire, and an intermittent operation switch directly connected to said heating wire, the series circuit comprising said intermittent operation switch and said heating wire being connected in parallel with said temperature responsive switch, whereby by simply closing the washer switch the washer is readily brought into operation and the wiper is also brought into operation with said thermal time delay, while on the other hand upon closing of the intermittent operation switch the wiper is intermittently operated at such intervals of time as related to said thermal time delay.

3,716,767

CONTROL DEVICE FOR ELECTRIC AUTOMOBILES INCLUDING ACCELERATOR POSITION AND CURRENT FEEDBACK

Sigeru Kuriyama and Seiki Kikuchi, Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

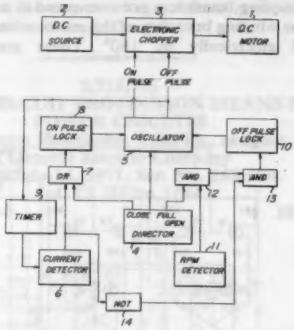
Filed Dec. 14, 1971, Ser. No. 207,781

Claims priority, application Japan, Dec. 26, 1970, 45/118,562

Int. Cl. H01p *7/00*

U.S. Cl. 318—139 **4 Claims**

For the purpose of controlling a wheel driving motor with the aid of a thyristor chopper, there is provided a multivibrator adapted to produce an "ON" gate pulse for rendering the chopper operative and an "OFF" gate pulse for rendering the chopper inoperative, and the cyclic period of oscillation of the multivibrator is controlled by means of an accelerator pedal. When the accelerator pedal is at its full open position and the speed is above a predetermined level, the multivibrator is locked not to provide "OFF" gate pulse. Output current of the thyristor chopper circuit is detected by a current detecting circuit. Provision is made for means for imparting preference command to the multivibrator to enable the latter to produce "OFF" gate pulse when the magnitude of the detected current reaches a predetermined level. The command circuit is designed so that the generation of "ON" gate pulse is temporarily locked after an "OFF" gate



pulse has been generated, thus securing the stability of control.

3,716,768

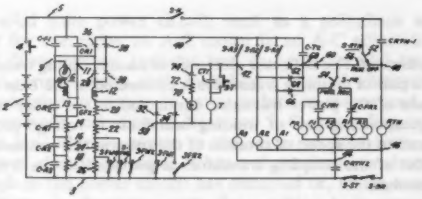
CONTROL ARRANGEMENT FOR ELECTRICALLY PROPELLED TRACTION VEHICLE

William B. Mason, Schenectady, N.Y., assignor to General Electric Company

Filed Mar. 20, 1972, Ser. No. 236,105

Int. Cl. H02p *7/14*

U.S. Cl. 318—139 **13 Claims**



A control arrangement for a battery powered traction vehicle having a foot pedal type of throttle control. Application of increasing pressure to the pedal sequentially closes a motor contractor to energize the motor, closes armature switches to decrease series armature resistance, and opens field weakening switches to provide field weakening. Provision is made for motor operation at predetermined torque-speed increment without continued application of pedal pressure. A logic circuit is responsive to closure of a preselected armature switch and of a preselected field weakening switch is connected in circuit with a relay connected to maintain operation of the vehicle at the desired torque-speed increment upon activation of a control switch.

3,716,769

BRUSHLESS D.C. MOTOR HAVING PERMANENT MAGNET ROTOR AND HALL EFFECT COMMUTATION INCLUDING SPEED CONTROL RESPONSIVE TO WINDING VOLTAGE

Julius Brunner, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany

Filed Dec. 22, 1971, Ser. No. 210,635

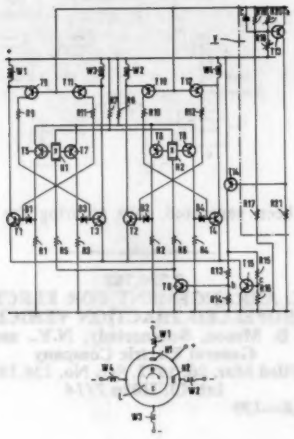
Claims priority, application Germany, Dec. 23, 1970, P 20 63 351.6

Int. Cl. H02k *29/00*

U.S. Cl. 318—254 **4 Claims**

A brushless DC motor comprises switching means coupled to and controlled in condition by a comparator circuit. The control current terminals of a pair of Hall effect generators are

connected to the negative polarity terminal of a DC voltage source through the switching means. The base electrodes of four coupling transistors are connected to each other. Each pair of coupling transistors are connected to a corresponding pair of the winding branches of the motor which are mutually displaced electrically by 180°. There are four power



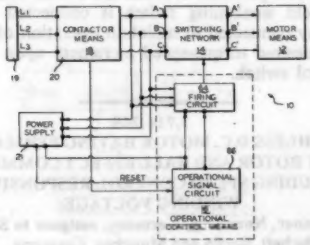
transistors. The collector electrode of each coupling transistor of a pair of coupling transistors is connected to the base electrode of the power transistor connected to the other of the corresponding pair of winding branches. A voltage proportional to the speed of rotation of the rotor at the emitter-base paths of the coupling transistors is provided at the winding branches.

3,716,770

SLOW START-STOP MOTOR CONTROL SYSTEM

Victor J. Habisohn, Hoffman Estates, Ill., assignor to Reliamatic, Inc., Chicago, Ill.

Filed April 20, 1970, Ser. No. 29,869
Int. Cl. H02m 1/18
U.S. Cl. 318—259 **36 Claims**



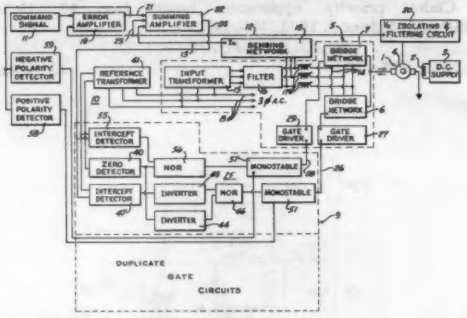
A solid state motor control system including means for providing a slow motor start by increasing torque at a slow rate until full torque is reached which corresponds to full speed, and a slow motor stop by increasing counter motor torque at a slow rate until the motor approaches zero speed.

3,716,771

DC MOTOR SPEED CONTROL WITH MOTOR VOLTAGE AND CURRENT SENSING MEANS

John T. Maynard, New Berlin, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation of Ser. No. 713,247, March 14, 1968, abandoned. This application March 1, 1971, Ser. No. 122,636
Int. Cl. H02p 5/16
U.S. Cl. 318—331 **16 Claims**



This disclosure is directed to a feedback control for a D.C. shunt motor for motoring and regenerating modes of operation. The motor armature is connected to a three-phase A.C. input by a pair of full wave bridge networks connected in parallel and having silicon controlled rectifiers in each leg.

Input and feedback signals are summated to an error signal which is then summated with a cemf signal to establish a control signal connected to actuate a gating regulating means which in turn controls firing of the controlled rectifiers of the two bridges with a zero current firing angle control.

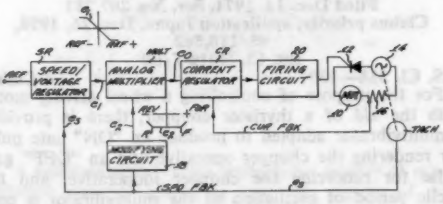
The gating regulator connected to the rectifier is a "nor" logic current for each unit and includes a zero current detector in combination with an intercept detector which provides an output during the proper half cycle of the applied voltage and further transmits a signal in accordance with the desired phase angle for firing of the controlled rectifier.

3,716,772

TAPERED CURRENT LIMIT PROTECTION FOR D. C. MOTOR

Dale E. Larson, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 28, 1972, Ser. No. 229,889
Int. Cl. H02p 5/16
U.S. Cl. 318—332 **11 Claims**



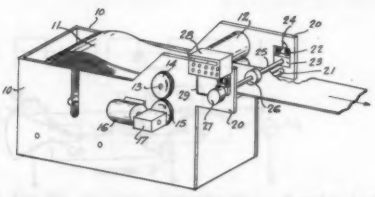
A tapered current limit control for a thyristor-powered direct current shunt motor lowers the current limit level in speed ranges wherein the current carrying ability of the motor is reduced. A variable transconductance analog multiplier is inserted between a speed/voltage regulator which derives the current reference and a current regulator which receives the modified current reference and controls the firing circuit for the thyristors, and a modifying circuit including an absolute value amplifier responsive to motor speed attenuates the gain

of the analog multiplier when motor speed exceeds predetermined magnitudes in both the forward and reverse directions of motor rotation.

3,716,773
DIGITAL CONTROL DEVICE FOR STRIP METAL FEEDER

Andrew Raoul, 672 E.C. Row Avenue, Windsor, 12, Ontario, Canada

Filed June 4, 1971, Ser. No. 150,046
Int. Cl. G05b *19/26*
U.S. Cl. 318—600 **14 Claims**



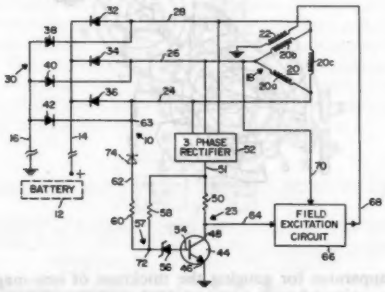
A control device for a strip metal feeder is described which provides a very accurate control of the distance of advancement of the strip metal during an operational cycle. The device comprises

a. a measuring wheel of known circumference adapted to engage the strip metal whereby rotational movement of the wheel is actuated by movement of the strip metal,
b. a rotary transducer operatively connected to said wheel for generating electric pulse data proportional to the rotation of the wheel, and
c. an electronic counter with presets for counting electric pulses received from the transducer and stopping the feeder after a predetermined number of pulses have been received.

3,716,774
VEHICLE POWER SUPPLY SYSTEM WITH VOLTAGE REGULATOR LOAD COMPENSATION

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 2, 1971, Ser. No. 168,242
Int. Cl. H02p *9/30*
U.S. Cl. 320—64 **8 Claims**

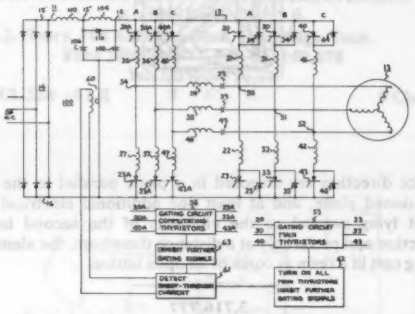


A power supply system for a vehicle providing power to a load remotely located therefrom and connected to the system by conductors having a predetermined voltage loss includes an electronic regulator circuit which controls the output voltage of the system. The regulator circuit is connected to sense the voltage drop across a rectifying diode connected to the output of the AC generator of the system, which varies in accordance with the current output of the generator, and in accordance therewith varies the output voltage of the system to compensate for the loss in said conductors.

3,716,775
SHORT CIRCUIT PROTECTION MEANS FOR POWER CIRCUITS

Einar Aasen Skogsholm, Erie, Pa., assignor to General Electric Company

Filed July 14, 1971, Ser. No. 162,575
Int. Cl. H02m *5/44*
U.S. Cl. 321—5 **16 Claims**



A solid state power circuit, such as a polyphase inverter for energizing an A-C motor in an A-C adjustable speed drive system, includes two or more parallel connected series circuits each including a pair of alternately conductive thyristors in series inductive means and a filter network including at least two L-C stages for supplying D-C electric power to the series circuits from a source of electric potential. When a short circuit or shoot-through in the power circuit has occurred or, under some conditions, is about to occur, the resulting high current flow to the series circuits from the filter network is detected and all of the thyristors of at least two of the series circuits are turned on simultaneously in response to the detected current such that the filter capacitor of the L-C stage adjacent the series circuits will resonate with the total effective parallel inductance in the series circuits to provide sufficient reverse voltage to turn off all of the thyristors. To respond to increased current flow resulting from a wide range of fault conditions in an effective and economical manner, the detection means is responsive to the capacitive current flow in at least two of the L-C stages including the two stages adjacent the series circuits. A diode or similar rectifier is provided across the filter inductor of the L-C stage adjacent the series circuits to prevent excessive voltage on the resonating capacitor, to control ripple voltage, and to prevent undamped oscillations in the filter network.

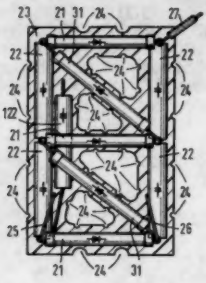
3,716,776
HIGH VOLTAGE RESISTANT ELECTRICAL COMPONENT, IN PARTICULAR FOR COLOR TELEVISION RECEIVERS

Rainer Dangschat, Landsham, Germany, assignor to Siemens Aktiegesellschaft, Berlin and Munich, Germany

Filed April 21, 1972, Ser. No. 246,459
Claims priority, application Germany, May 19, 1971, P 21 24 981.0
Int. Cl. H02m *7/00*
U.S. Cl. 321—8 R **4 Claims**

A high voltage resistant lattice-shaped electrical component employs a plurality of capacitors and diodes interconnected and arranged as a lattice structure in perpendicular lattice

directions and in a direction inclined to the perpendicular directions, those elements which are arranged in a first lattice direction and both elements which are inclined thereto being disposed in one plane and the elements arranged in the second



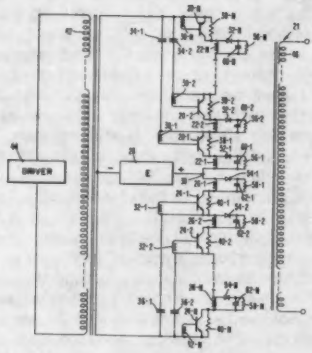
lattice direction are disposed in a plane parallel to the first mentioned plane, and at least one additional electrical element lying parallel to the elements of the second lattice direction and preferably at a distance therefrom, the elements being cast in a resin as cores of an open lattice.

3,716,777

INVERTER POWER SUPPLY EMPLOYING SERIES CONNECTED MULTI-TRANSISTOR SWITCHES

George W. Lynch, Tappan, N.Y., and Charles B. Zarowin, Rowayton, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1971, Ser. No. 181,028
Int. Cl. H02m 7/48
U.S. Cl. 321—27 R **1 Claim**



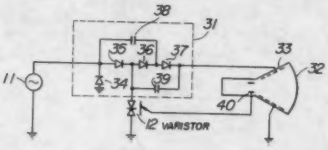
The disclosure describes an inverter circuit which may be used as a power supply. The circuit includes an even number plurality of transistors connected in series with a source of potential connected to the mid-point of the series arrangement. Each of the transistors has a secondary transformer winding connected across its base and emitter which is coupled to a primary transformer driven by an input signal source. The secondary transformer windings are connected through capacitors to a common point, for example, one end of a DC power supply. A resistor is connected across the emitter and collector of each transistor for uniform static voltage distribution and the transistors are connected in series by separate ones of a set primary output transformer windings connected between each transistor. A "poled RC" circuit including a diode, a capacitor and a resistor is connected across each transistor for dynamic voltage distribution. A secondary output transformer winding is also included across which an output voltage is produced which in the preferred embodiment may be a square wave voltage.

3,716,778

HIGH VOLTAGE GENERATING APPARATUS

Hideo Sato, Tokyo, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan

Filed April 7, 1971, Ser. No. 132,095
Claims priority, application Japan, April 9, 1970, 45/30326
Int. Cl. G05f 1/00
U.S. Cl. 323—8 **5 Claims**



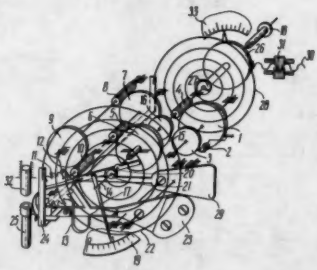
A rod shaped varistor having a high breakdown voltage is connected across a source of high voltage so as to maintain the output voltage at a substantially constant value. The varistor is provided with a ring-shaped terminal for deriving an intermediate voltage which is adjustable by moving the ring-shaped terminal along the varistor.

3,716,779

MAGNETIC SPRING-CONTROLLED WINDING APPARATUS FOR GAGING THE THICKNESS OF NON-MAGNETIC COATINGS ON METAL PRODUCTS

Nikolai Sergeevich Akulov, Minsk, U.S.S.R., assignor to Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR, Minsk, U.S.S.R.

Filed Feb. 1, 1971, Ser. No. 111,324
Int. Cl. G01r 33/12
U.S. Cl. 324—34 TK **2 Claims**



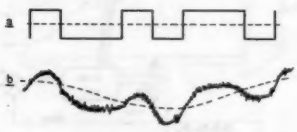
An apparatus for gauging the thickness of non-magnetic coatings on metal products comprising a winding arrangement including an auxiliary lever adapted to engage a main lever carrying a permanent magnet, a gear train having shaft mounted gears, one of the shafts in the gear train of the apparatus mounting an auxiliary spring element linked to said auxiliary lever, to provide movement of the permanent magnet toward an auxiliary magnet upon the former breaking contact with the surface of the coatings.

3,716,780

SYSTEM FOR THE ACCURATE REPRODUCTION OF PULSE CODE MODULATION SIGNALS RECEIVED AS AN UNFAVOURABLE SIGNAL-TO-NOISE RATIO

Cornelis Johannes van Elk, Jacob Frederik Raatgever, Albertus Marinus Morrien, Jan Gijsbert, and Dirk van der Lee, Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,150
Claims priority, application Netherlands, Apr. 4, 1970, 7004875
Int. Cl. H04b 1/12
U.S. Cl. 325—324 7 Claims



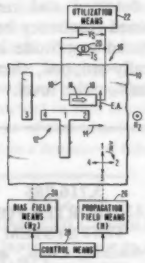
A system for the accurate reproduction of pulse code modulation signals received at an unfavourable signal-to-noise ratio, comprising two signal integrators controlled by clock pulses and a detection circuit connected thereto, which together form part of a first control loop for phase readjustment of the clock pulse generator and a second control loop for rendering the reference level required for detection of the transitions and the direct voltage level of the incoming signal equal to each other.

3,716,781

MAGNETORESISTIVE SENSING DEVICE FOR DETECTION OF MAGNETIC FIELDS HAVING A SHAPE ANISOTROPY FIELD AND UNIAXIAL ANISOTROPY FIELD WHICH ARE PERPENDICULAR

George S. Almasi, Purdy Station, George E. Keefe, Montrose, Yeong S. Lin, Mount Kisco, and David A. Thompson, Somers, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1971, Ser. No. 193,904
Int. Cl. G01r 33/02
U.S. Cl. 324—46 34 Claims



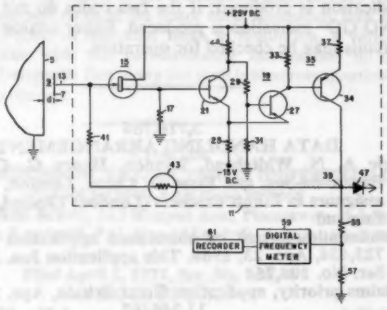
A magnetoresistive sensing device for detection of magnetic flux, comprising a magnetoresistive sensing element in which the shape anisotropy field is substantially perpendicular to the uniaxial anisotropy field. The larger of these two magnetic fields is in a direction which is substantially normal to the direction of the signal flux which is to be detected, to insure that the magnetization vector of the sensing element will return to its rest state when the signal magnetic flux is removed. The easy axis of the sensing element can be either parallel or normal to the signal magnetic field direction. Current through the sensing element is preferably provided by a constant current source connected to the element. The direction of current through the element can be either along the direction of the quiescent magnetization state or perpendicular to it. Applications include magnetic bubble domain sensing and sensing of stored magnetic signals on disks or tapes.

3,716,782

CAPACITANCE GAGE FOR MEASURING SMALL DISTANCES

John J. Henry, 105 Audubon Road, Oak Ridge, Tenn.

Filed June 3, 1971, Ser. No. 149,678
Int. Cl. G01r 27/26
U.S. Cl. 324—61 R 9 Claims



This invention is a capacitance gage for measuring small distances wherein the frequency of an R-C oscillator is varied in proportion to changes in the capacitance responsive to changes in separation between a plate mounted with the gage and a grounded object whose distance is being measured. The gage plate is connected to the input of a Schmitt trigger circuit by means of a field effect transistor amplifier. The output of the Schmitt trigger circuit controls an electronic switch which alternately charges and discharges the probe capacitance in response to the output of the Schmitt trigger circuit between upper and lower voltage triggering levels and the charging frequency is taken in digital form at the output of the switch. The variable frequency output is suitable for high-accuracy, non-contact dimensional inspection with digital readout or direct computer processing. The gage further provides improved performance for medium to high-resistance materials and can be compensated to provide a low temperature drift.

3,716,783

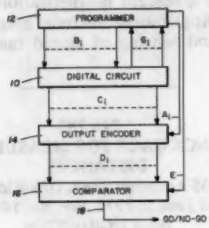
SEQUENTIAL CHECK-OUT SYSTEM INCLUDING CODE COMPARISON FOR CIRCUIT OPERATION EVALUATION

Charles S. Deering, Richardson, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 30, 1969, Ser. No. 872,582
Int. Cl. G01r 15/12, 31/00
U.S. Cl. 324—73 14 Claims

A "GO" or "NO GO" indication of circuit operation is produced by exercising the operation of the circuit through various modes. To evaluate the operation of a circuit, a programmer produces a series of input check signals in a sequence determined by control pulses. These check signals are connected to the inputs of the circuit under evalu-

ation and exercise the circuit through the various operating modes. As the circuit is exercised, output signals are produced which connect to an encoder. The encoder produces an operations code in response to the circuit output signals. This operations code is compared with a standard



code which has been derived in advance. If the operations code compares favorable with the standard code, a "GO" indication is produced; if the two codes do not match, a "NO GO" indication is produced. Either analog or digital circuits may be checked for operation.

3,716,784

DATA HANDLING ARRANGEMENTS

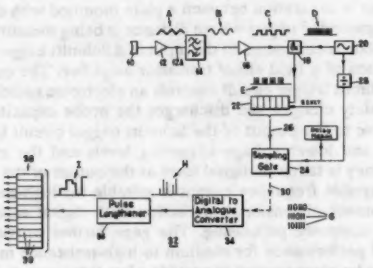
Eric A. N. Whitehead, London, Henry G. Carpenter, Barton-on-Sea, and Peter D. Chinn, London, England, assignors to Elliott Brothers (London) Limited, London, England

Continuation-in-part of abandoned application Ser. No. 723,434, Apr. 23, 1968. This application Jan. 22, 1971, Ser. No. 108,754

Claims priority, application Great Britain, Apr. 27, 1967, 11,249/67

Int. Cl. G01r *23/16, 23/00*

U.S. Cl. 324—77 B **9 Claims**



A data handling system for transmitting the frequency spectrum of an input band-limits the input, converts it into a rectangular waveform, and gates the "mark" pulses of the waveform with clock pulses. Each set of gated clock pulses, representing in number the width of the "mark" pulse, is fed into a binary counter. Sampling means, operative at a submultiple of the clock pulses, repeatedly samples the count of the counter and transmits the binary count values to a receiver. There, they are converted into a rectangular waveform whose amplitude varies with the digital values, and the rectangular waveform, whose frequency spectrum corresponds with the frequency spectrum of the band-limited input, is then fed to a frequency analyser. In a multi-channel version of the system, in which the input to each channel is derived from a respective one of an array of transducers, the counters of the channels are sampled sequentially and transmitted to the receiver which weights and combines them so as to produce an output representing the response of the array in a particular one of several different directions.

3,716,785

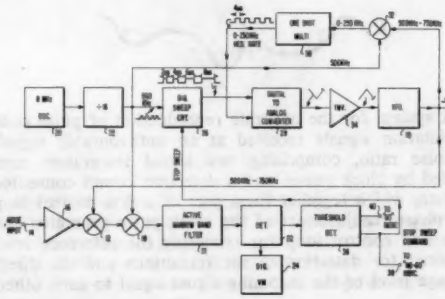
DIGITALLY CONTROLLED WAVE ANALYZER

Harvey M. Masters, Ellicott City, and John L. Nugent, Martin Hunt, and James Peters, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 22, 1971, Ser. No. 155,495

Int. Cl. G01r *27/00*

U.S. Cl. 324—77 B **10 Claims**



Apparatus for measuring noise spectra, both AM (amplitude modulation) and FM (frequency modulation), of RF signals over a predetermined frequency range by sweeping a variable frequency square wave oscillator by means of an analog ramp signal generated by a digital sweep circuit which produces a sequence of square wave pulses whose pulsewidth incrementally increases by the same amount over a predetermined time period. The variable frequency oscillator is driven and automatic frequency controlled from a digital clock oscillator which is also fed to a mixer. The mixer is directly coupled to a first mixer which has inputs comprising the noise signal input and the variable frequency oscillator signal applied thereto. The first and second mixer configuration provides a frequency window through which the desired noise waveform can be detected and measured. The system sweeps a predetermined frequency band and when a noise signal of predetermined amplitude is detected, the sweep circuit is automatically stopped, thereby locking onto an input signal of excessive noise level.

3,716,786

MODULE TESTER AND SORTER FOR USE IN A MODULE TEST SYSTEM

John M. Gearin, Brookfield, Conn., assignor to Cogar Corporation, Wappingers Falls, N.Y.

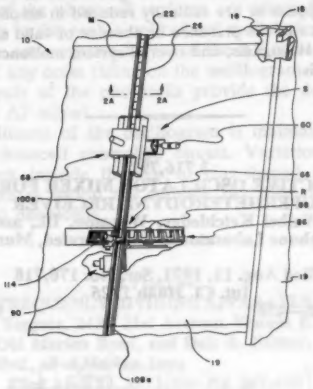
Filed Oct. 2, 1970, Ser. No. 77,454

Int. Cl. G01r *31/22, 15/12*

U.S. Cl. 324—158 F **7 Claims**

A module tester and sorter for determining the electrical characteristics of each of a series of memory modules. If the module has certain characteristics, it is transported by an index wheel to a designated loading bin. If the module has other characteristics, it is transported through the wheel into a different loading bin. A probe is included in the unit and has

an array of contact fingers which as a group are shiftable in a direction transverse of the pins for a position which does not



interfere with movement of the modules to a position engaging the module pins to make electrical contact for the purpose of testing the module circuit.

3,716,787

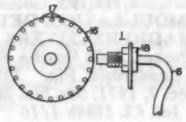
APPARATUS FOR MONITORING SPEED UTILIZING A TUNED CIRCUIT WHOSE PHASE CHANGES IN PROPORTIONAL TO SPEED

Peter W. Hammond, Chargin Falls, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 27, 1970, Ser. No. 93,116

Int. Cl. G01p *3/56*

U.S. Cl. 324—173 **4 Claims**



A motion detector system using a pulse tachometer comprising a wheel of non-magnetic, non-conductive material such as fiber or Teflon having a plurality of equally spaced magnetically distinct pins in the periphery which move into proximity of a pick-up coil of a tuned circuit to vary the impedance therein. Varying the impedance effects a circuit phase-shift which is compared with a predetermined reference phase of voltage and current in said circuit to provide an indication of any movement of the wheel and a measurement of the speed of movement in a measured time interval.

3,716,788

TACHOMETER GENERATOR

Koji Nishida, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

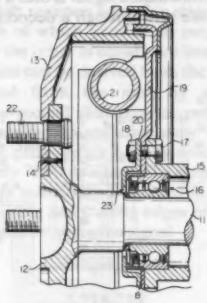
Filed Dec. 22, 1970, Ser. No. 100,625

Claims priority, application Japan, Dec. 23, 1969, 44/122541

Int. Cl. G01p *3/48*

U.S. Cl. 324—174 **4 Claims**

A tachometer generator has a toothed stator and a toothed rotor which may be formed in one piece with the revolvable inner race of a bearing supporting a shaft whose revolving speed is to be measured, the toothed stator is fixed to the stationary outer race of the same bearing, in such a manner that the toothed surfaces of the rotor and the stator are opposed to each other with a small airgap therebetween. The bearing outer race also supports magnetic means having a coil disposed in a magnetic path formed by the aforesaid bearing



and the rotor and stator of the tachometer generator, so that, as the crests and roots of the stator teeth alternately face the crests and roots of the rotor teeth in revolution, a voltage which varies with the corresponding fluctuations in the amount of magnetic flux along the path is electromagnetically induced in the coil.

3,716,789

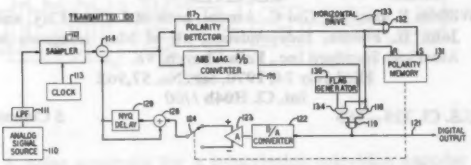
SIGN REDUNDANCY REDUCTION IN DIFFERENTIAL PULSE MODULATION SYSTEMS

Earl Franklin Brown, 513 Runyon Ave., Piscataway, N.J., and William Kaminski, P.O. Box 155A, R.D. Asbury, West Portal, N.J.

Filed April 1, 1971, Ser. No. 130,409

Int. Cl. H04l *3/00*

U.S. Cl. 325—38 A **6 Claims**



A differential pulse code modulation system substantially reduces sign redundancy by transmitting a flag signal only when a change in polarity exists between differential samples. Between the flag signals, only the absolute magnitude of the differential samples is transmitted. In another arrangement, an amplitude word is transmitted after a second flag signal which signifies a change in polarity of a differential sample accompanied by a large amplitude level. The amplitude word operates an expanded scale coding mode which assigns a quantized level to the differential sample that is changed in sign.

3,716,790

SINGLE SIDEBAND SYSTEM UTILIZING TWO TONE MODULATION

Paul E. Romoser, Lorain, Ohio, assignor to Lorain Electronics Corporation

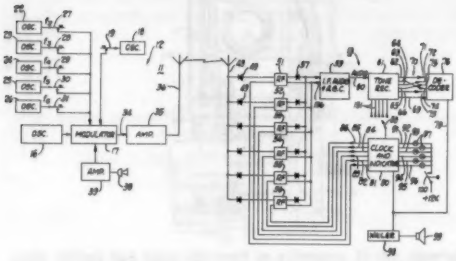
Filed May 11, 1970, Ser. No. 36,358

Int. Cl. H04b *1/68*

U.S. Cl. 325—49 **17 Claims**

Selective calling of any one of a plurality of receivers is provided in a single sideband system with calling on any one of a

plurality of radio-telephone carrier channels. A first audio tone plus a sequence of five additional audio tones modulate the carrier and the carrier and one sideband is fully suppressed before transmission. In the receiver demodulation takes place to produce an output audio tone dependent upon the difference of the first audio tone and any one of the other five audio tones. The demodulated signal is thus a sequence of five audio tones which are sent through a decoding device which



does not give a signal if the code is incorrect or if the length of time between tones is not correct. If both of these are correct, then a calling signal is audibly or visibly displayed at the receiver station. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

ERRATUM

For Class 325—324 see:
Patent No. 3,716,780

3,716,791
FLAG ALARM SYSTEM APPLICABLE TO A VOR RECEIVER

William S. Harries; Gul C. Asnani, both of Kansas City, and John H. Flentie, Independence, all of Mo., assignors to American Standard Inc., Falls Church, Va.

Filed July 24, 1970, Ser. No. 57,962
Int. Cl. H04b 1/00
U.S. Cl. 325—363 5 Claims

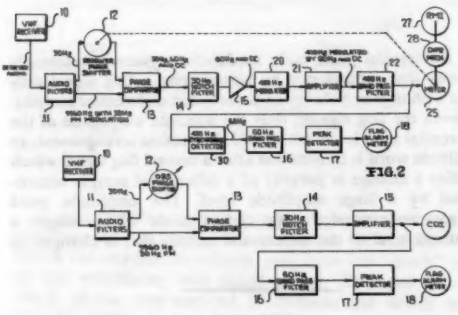


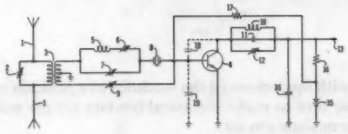
FIG.2

A flag alarm system for a VOR receiver (applicable to other purposes) in which two 30 Hz signals of relatively variable phase normally present in two channels of the receiver, while the latter is operating properly, are multiplied together to produce modulation products including a dc component having a value which is a function of said phase, and which in one form of the invention is employed in a servo loop which indicates or controls said phase, and also a double frequency signal of peak amplitude independent of phase difference but a function of the products of the amplitudes of the 30 Hz signals. The double frequency signal operates to hold a flag inoperative, but cannot hold the flag if either or both 30 Hz signals disappear or are radically reduced in amplitude. The system indicates the presence or absence of valid signals, i.e. the two 30 Hz signals, and overall system malfunction, on a fail-safe basis.

3,716,792
SELECTIVE OSCILLATOR MIXER FOR A SUPERHETERODYNE RECEIVER

Raymond Waibel Ketchledge, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1971, Ser. No. 170,718
Int. Cl. H04b 1/26
U.S. Cl. 325—438 9 Claims

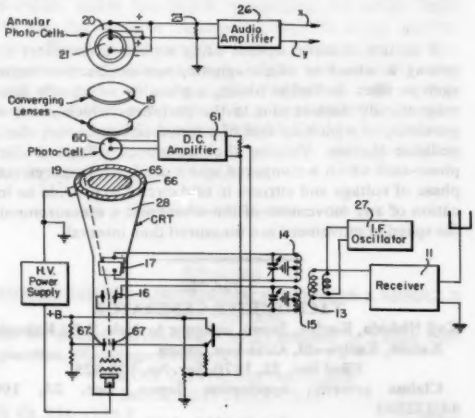


A frequency selective oscillator mixer for a superheterodyne receiver takes the form of a radio frequency band selection filter and a transistor feedback oscillator in which a single piezoelectric crystal is connected in common both in the feedback path of the oscillator and in the filter and the oscillation frequency of the oscillator and the pass band of the filter are tuned to frequencies substantially equal to but slightly different from different harmonics of the crystal.

3,716,793
AMPLITUDE MODULATION DETECTOR FOR RADIO RECEIVERS

Louis W. Parker, 2408 Sunrise Key Blvd., Fort Lauderdale, Fla. 33304

Filed Dec. 7, 1971, Ser. No. 205,532
Int. Cl. H04b 1/16
U.S. Cl. 325—487 15 Claims

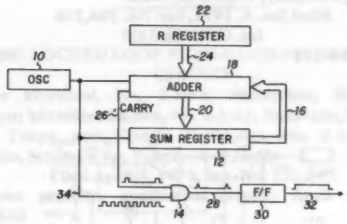


The IF carrier in a radio receiver is used to control the deflection circuits of a cathode ray tube to cause a circular sweep of the tube beam. Light from the resultant

circular oscillogram is projected onto two ring-shaped concentric photocells in such fashion that the light falls partially between and partially on said photocells with each photocell receiving one polarity of the AF wave. The sizes of the photocell surfaces are selected so as to extend only to the peak amplitude of modulation on both the positive and negative halves of the AF cycle, to effect clipping of any noise riding on the oscillogram. The combined outputs of the photocells provide the desired demodulated AF signal.

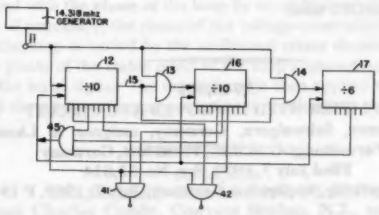
The brilliance of the oscillogram is maintained by a separate photocell controlled circuit. Variations in the basic circuit include the use of ring-shaped secondary emission plates within the cathode ray tube, instead of ring-shaped photocells.

3,716,794
FREQUENCY DIVIDING APPARATUS
Eugene D. Teggatz, 2435 21st Avenue; Vincent R. De Long, R.R. 2, Old Marion Road, and Dale A. Holtzer, 2550 McGowan Blvd., all of Marion, Iowa
Filed April 26, 1972, Ser. No. 247,628
Int. Cl. H03k *21/00*
U.S. Cl. 328—39 **5 Claims**



Apparatus for altering the frequency of a signal by values other than whole number division comprising the use of an adder and a register for consecutively and cumulatively adding an input number at a rate coincident with the frequency of a signal to be frequency divided and providing an output indicative of each occurrence of the cumulative sum exceeding a predetermined value.

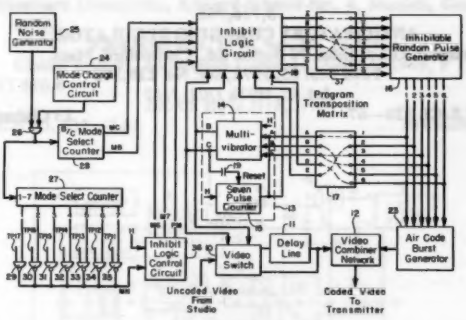
3,716,795
TIME COMB GENERATOR
Buck C. Brown, Rockville, Md., assignor to Control Concepts Corporation, Rockville, Md.
Filed March 18, 1971, Ser. No. 125,647
Int. Cl. H03k *3/02*; H04n *5/06*
U.S. Cl. 328—63 **4 Claims**



A time comb generator for a television synchronizing generator having a series of three shift register dividers connected in cascade. A pulse train having a frequency of 14.318 MHz is fed to the first shift register which divides the frequency of the pulse train by ten. The divided signal is then fed to a second shift register which also divides by ten. The output of the second shift register is then fed to a third shift register which divides by six. The cascaded arrangement of shift registers are recycled each time 455 pulses have been fed thereto. This is twice the rate at which the horizontal lines are scanned in a television system.

The first two shift registers have five stages and the last has three stages, each of which provide an output incrementally time spaced from the other at equal time intervals, that is, e.g., 10 different outputs can be derived from the first shift register, one being spaced from the next by approximately 70 nanoseconds. The second shift register provides ten equally spaced output signals each approximately 700 ns apart. The third shift register provides six equally spaced output signals each approximately 7000 ns apart. The outputs from the various stages are then selectively combined in a desired manner to position the leading and trailing edges of the various component signals in a television sync signal.

3,716,796
SEMI-RANDOM PULSE GENERATOR
Hyacint E. Harna, Cicero, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Nov. 3, 1971, Ser. No. 195,344
Int. Cl. H03b *29/00*
U.S. Cl. 328—63 **10 Claims**

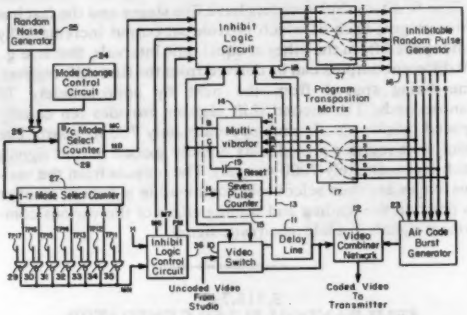


A pulse generator for a subscription television encoder or the like produces control pulses at semi-random intervals of predetermined average duration. The circuit comprises a multi-stage counter to which random noise pulses are periodically applied for a predetermined time interval. At the end of the interval a control pulse is produced if and only if the individual stages of the counter all occupy the same state. To decrease the average interval between control pulses, one or more of the counter stages is selectively forced into the desired state by a switch circuit.

3,716,797
INHIBITABLE RANDOM PULSE GENERATOR
Melvin C. Hendrickson, Elmhurst, and Richard G. Merrell, Darien, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Nov. 4, 1971, Ser. No. 195,728
Int. Cl. H03b *29/00*
U.S. Cl. 328—63 **6 Claims**

An inhibitable random pulse generator for a subscription television system or the like generates an output pulse indicative of a random one of a plurality of possible counting states, one or more of which may be inhibited to narrow selection to the remaining states. A

plurality of logic elements within the generator are connected in a novel mutually-exclusive circuit whereby one and only one can produce an output at a time. Individual sources of random noise applied to each element produce an output from an unpredictable one of the elements.



Provision is made for inhibiting selected generator outputs by preventing the application of noise to the associated element, and a test mode is provided wherein timing pulses are applied to the elements to obtain a repetitive predictable output.

3,716,798

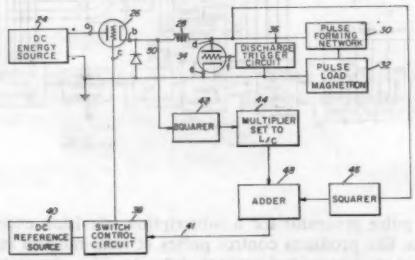
ANTICIPATORY CHARGING REGULATOR

James P. O'Loughlin, 70 Boston Rd., Chelmsford, Mass.

Filed Feb. 25, 1972, Ser. No. 229,375

Int. Cl. H03k *1/02, 1/12*

U.S. Cl. 328—67 **13 Claims**



A regulator for resonant-charging circuits in which the state of the energy storage elements of the charging circuit, which includes the charging inductance and pulse-forming network, are measured as the circuit is charged and the charging is halted when the total energy in these elements is at a desired level.

3,716,799

CIRCUIT ARRANGEMENT FOR INTERFERENCE-FREE RECOGNITION OF THE ZERO CROSSINGS OF SINE-LIKE SIGNALS

Guenther Haass, and Dieter Reinhardt, both of Weitheimer Strasse 91, Munich, Germany

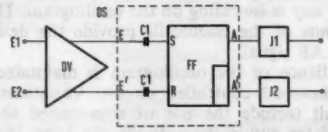
Filed April 5, 1971, Ser. No. 131,353

Claims priority, application Germany, April 24, 1970, P 20 20 187.0

Int. Cl. H03k *5/20, 17/30*

U.S. Cl. 328—150 **2 Claims**

An arrangement for recognizing zero crossings of sine-like signals in the presence of interference utilizes a bistable flip-flop circuit which is capacitively coupled to receive input signals from a differential amplifier having a pair of inputs which are symmetrical with respect to ground. The coupling capacitors and the bias resistors of the flip-flop circuit provide



a switching threshold which is smaller during a succession of useful signals and during receipt of individual interference signals. The flip-flop circuit feeds impulse generating means to provide correctly timed, for example, rectangular signals.

3,716,800

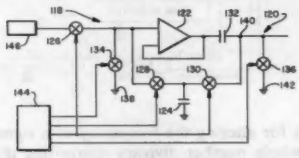
SAMPLE AND HOLD CIRCUIT

James V. Di Rocco, Winchester, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed Jan. 6, 1971, Ser. No. 104,216

Int. Cl. H03k *5/00*

U.S. Cl. 328—151 **4 Claims**



In a sample and hold circuit employing one operational amplifier connected in a high impedance voltage follower configuration, a first switch is connected to the input of the amplifier and second and third switches are connected serially between the output and input terminals of the amplifier. A capacitor is connected between the junction point of the second and third switch and ground. During the sample period, the first and third switches are energized to the ON state and the capacitor is charged to the voltage appearing at the output of the amplifier, the second switch being in the OFF state. During the hold period, the second switch is energized to the ON state and the charge on the capacitor is applied to the input of the amplifier, the first and third switches being in the OFF state.

3,716,801

AMPLIFIER WITH IMPROVED AVC CIRCUIT

Willy Minner, Schwalgern, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed July 7, 1970, Ser. No. 52,814

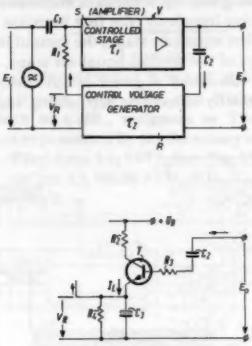
Claims priority, application Germany, July 7, 1969, P 19 34 306.7

Int. Cl. H03g *3/30*

U.S. Cl. 330—29 **2 Claims**

An improved AVC circuit for an alternating voltage amplifier which prevents over-control, and thus temporary blocking of the amplifier circuit, upon the occurrence of a sudden large increase in the amplitude of the input signal to the amplifier.

The control voltage generating arrangement of the AVC circuit is constructed so that the time constant of the control



voltage is increased proportionately to the increase of the output voltage from the amplifier when ever the output voltage exceeds a predetermined value.

3,716,802

PHASE LOCKED LOOP WITH RAPID PHASE PULL-IN CIRCUIT

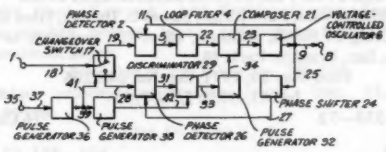
Takuro Muratani, No. 2-19-8, Nishiochiai, Shinjuku-ku, Tokyo; Michihisa Okawa, No. 2-1-11, Naka-cho, Musashinoshi, Tokyo, and Hiroshi Nakamura, No. 6-1, 4-chome, Kyodo, Setagaya-ku, Tokyo, all of Japan

Filed April 5, 1971, Ser. No. 131,047

Claims priority, application Japan, April 10, 1970, 45/30548

Int. Cl. H03b *3/04*

U.S. Cl. 331—8 **7 Claims**



In a loop comprising a phase detector, a low pass filter and a voltage-controlled oscillator, the phase of the output oscillation of the oscillator is synchronized with the phase of the input signal supplied to the loop. Prior to the supply of the input signal to the loop, the phase of the input signal is compared with the phase of the loop by an additional phase detector. If necessary, the phase of the voltage-controlled oscillator in the loop is varied by the additional phase detector so that the phase of the stable point of the loop approaches the phase of the input signal. The input signal is then applied to the loop and the synchronization operation is provided.

3,716,803

STABILIZED DELTA MODULATOR

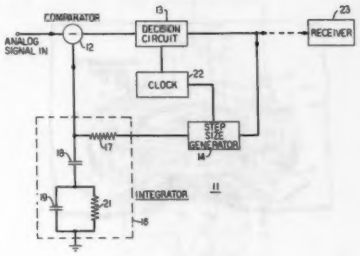
James Charles Candy, Convent Station, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Dec. 27, 1971, Ser. No. 212,311

Int. Cl. H03k *13/22*

U.S. Cl. 332—11 D **5 Claims**

In delta modulators, especially those known as adaptive delta modulators, numerous factors such as noise, delay, decision circuit hysteresis, and poor adaptive algorithms can result in instabilities in the form of low frequency, high amplitude oscillations.



Instabilities can be eliminated through means for producing an overshoot in the integrator output, and actuating the decision circuit while the overshoot is present.

3,716,804

INTEGRATED OPTICAL-ELECTRONIC SOLID STATE SYSTEM

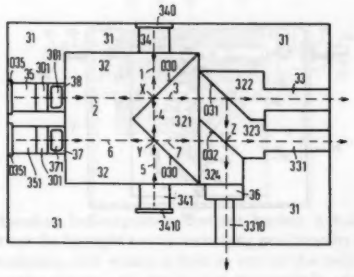
Eberhard Groschwitz, Edward-Schmid-Str. 4, Munich, Germany

Filed March 31, 1970, Ser. No. 24,170

Claims priority, application Germany, April 3, 1969, P 19 17 400.6

Int. Cl. H01s *3/18, 3/10*

U.S. Cl. 332—7.51 **20 Claims**

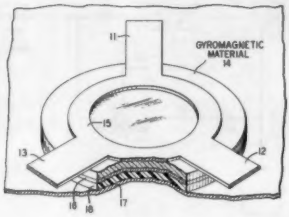


A crystal substrate integrates a plurality of optically and electronically operating components. The substrate has a surface having a matrix having at least two circuit layers one above the other and each substantially parallel to the surface of the substrate. The components are positioned in the two circuit layers. Optical paths optically intercouple corresponding ones of the optical components and extend in at least one of the layers predominantly in directions parallel to the surface of the substrate. An optical guide plate propagates light within and parallel to the guide plate in any desired directions. The guide plate comprises different optically functional areas. At least two solid state light sources are optically coupled to the guide plate in a manner whereby when the light sources are operative an information content is provided comprising information components constituted by a network of optically correlated component light beams. The information content has an information structure comprising a plurality of adjustable information components.

3,716,805
DELTA CONNECTED LUMPED ELEMENT CIRCULATOR

Reinhard Heinrich Knerr, Route 1, Orefield, Pa.

Filed Aug. 30, 1971, Ser. No. 175,868
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 9 Claims

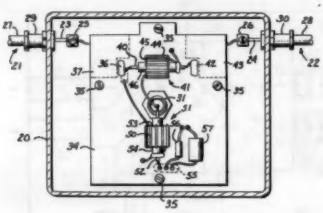


A junction strip line circulator of the lumped constant type in which the gyromagnetically coupled strip line members are delta connected in the common region and tuned by three capacitors effectively connected respectively from each vertex of the delta to a common point and by a further reactance from the common point to the strip line ground plane. Separate mode tuning is facilitated and the crossovers usually found in Y-connected circulators are eliminated.

3,716,806
SIGNAL COUPLING APPARATUS UTILIZING HYBRID TRANSFORMER

Martin L. Zelenz, 11 Joanne Avenue, Seneca County, Seneca Falls, N.Y.

Filed Aug. 19, 1971, Ser. No. 172,981
Int. Cl. H01p 5/14; H03h 7/48
U.S. Cl. 333—10 5 Claims



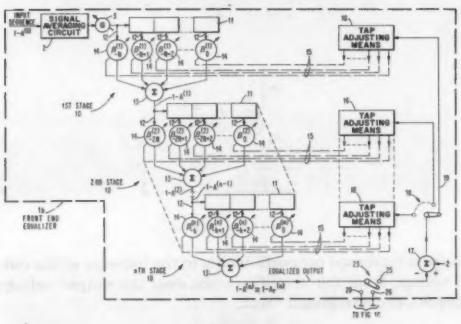
A hybrid transformer signal coupling apparatus is disclosed wherein one winding is a coaxial conductor having an outer conductor which provides electrostatic shielding between the center conductor and a second winding wound on a core of magnetic material. The hybrid transformer is used in a directional coupler for broadband signals such as television signals carried via a coaxial cable.

3,716,807
RECURSIVE AUTOMATIC EQUALIZER AND METHOD OF OPERATION THEREFORE

Richard T. Sha, Mohegan Lake, and Donald T. Tang, Yorktown Heights, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed May 24, 1971, Ser. No. 146,371
Int. Cl. H04b 3/04
U.S. Cl. 333—18 26 Claims

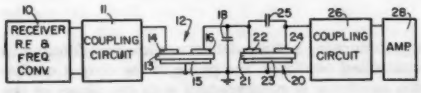
A recursive automatic equalizer with extremely fast convergence is disclosed. The equalizer includes a plurality of equalizer stages connected in cascade which first reduces impulse response of the communication channel to substantially zero. The front portion or sidelobe is reduced to substantially zero distortion by adjusting the tap settings of successive equalizer stages after successive iterations (the first iteration adjusts the tap settings of the first equalizer stage, the second iteration adjusts the tap settings of the second equalizer stage, and so on) such that after n iterations a given initial distortion D is reduced to substantially zero. The tap setting algorithm involved and the method of operating the cascaded equalizer is disclosed. Finally, after n iterations, the output signal which can be described by the function $1-A^{(n)}$ is modified by the reciprocal of the foregoing function and, is this manner, the rear or trailing portion of an input signal which is to be equalized has its rear sidelobe distortion reduced to substantially zero leaving only the desired main pulse. Apparatus for modifying the trailing or rear end of a pulse to be equalized is also disclosed.



3,716,808
BANDPASS FILTER INCLUDING MONOLITHIC CRYSTAL ELEMENTS WITH RESONATING PORTIONS SELECTED FOR SYMMETRICAL RESPONSE

Stanley Malinowski, Park Ridge; James L. Dailing, Glen Ellyn, and Craig P. Smith, Addison, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

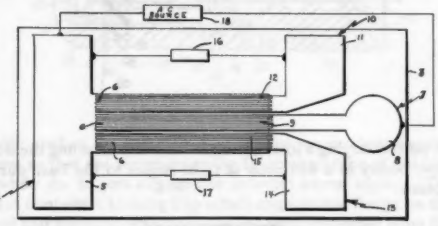
Filed May 20, 1971, Ser. No. 145,206
Int. Cl. H03h 7/10, 7/00
U.S. Cl. 333—72 16 Claims



A bandpass filter circuit includes a pair of dual coupled monolithic crystal filter elements each formed by a wafer of quartz, or other piezoelectric material, with two pairs of electrodes thereon, each pair cooperating with the wafer to form a resonating portion. The two dual coupled crystal elements are cascade coupled, with the signal to be selected applied to the first pair of electrodes on the first element, then coupled from the second pair of electrodes of the first element to the first pair of electrodes of the second element, and the selected signal derived from the second pair of electrodes of the second element. To reduce the requirement for inductive coupling elements in the filter, the monolithic filter elements are constructed so that the resonant frequencies of certain resonating portions thereof are below the mesh frequencies of the filter, which are at the center frequency of the filter. To provide a filter response characteristic having improved selectivity, i.e. steep skirts, a capacitor is bridged across the electrodes of at

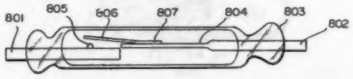
least one of the crystal elements. This causes a non-symmetrical response, and to correct this, the filter elements are constructed so that the resonant frequency of one resonating portion of at least one of the crystal elements is increased.

3,716,809
ACOUSTIC SURFACE WAVE RESONATOR
Thomas M. Reeder, Palo Alto, and Richard Smith, Balboa Island, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Aug. 11, 1971, Ser. No. 170,798
Int. Cl. H03h *9/04, 9/20, 13/00*
U.S. Cl. 333—82 R **1 Claim**



High Q performance is achieved in an acoustic surface wave resonator by the use of acoustic surface wave reflectors. The resonator input transducer and the reflectors are affixed to the propagation surface of a piezoelectric substrate member by photolithographic process. The input transducer is an interdigital structure having many long interleaving finger members. The reflectors also have long interleaving finger members and are positioned in close parallel relationship to the transducer finger members. The reflectors are electrically terminated by inductances.

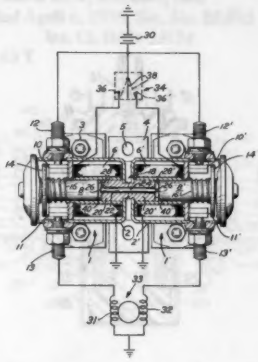
3,716,810
REED SWITCH
Toshito Hara, Kawasaki, and Toshiro Oguma, Suzaka-shi, Nagano-ken, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 8, 1971, Ser. No. 206,013
Claims priority, application Japan, Dec. 11, 1970, 45/109398
Int. Cl. H01h *51/28*
U.S. Cl. 335—154 **9 Claims**



A reed switch comprises a pair of reeds positioned so that the locus of operation of the free end of at least one of the reeds does not cross the other of the reeds. Contact material is provided in the area of the free end of each of the reeds. The contact material on at least one of the reeds is mounted to deviate from the free end of the one of the reeds.

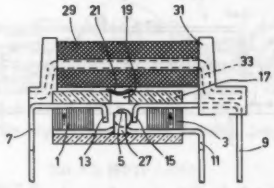
3,716,811
DOUBLE SOLENOID WITH INTERLOCK
Robert E. Prouty, 7 Northern Avenue, Logansport, Ind., and Robert D. Graf, 604 S. Willow Street, Flora, Ind.
Filed Sept. 20, 1971, Ser. No. 182,015
Int. Cl. H01h *9/26*
U.S. Cl. 335—160 **10 Claims**

A double solenoid electrical switching device comprises a pair of solenoid switches mounted together on a common base, the plungers of which are spaced from each other by a longitudinally movable interlock pin having a length which is such that when the contacts of one of the solenoids are closed,



the pin is moved by the plunger of that solenoid to a position in which the plunger of the other solenoid is prevented from moving so as to simultaneously close its contact.

3,716,812
BISTABLE BALL-ARMATURE CONTACT
Reinhard Cornelis Greve, and Hendrik Johannes De Jong, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 13, 1971, Ser. No. 179,775
Claims priority, application Netherlands, Sept. 23, 1970, 7014026
Int. Cl. H01h *51/24*
U.S. Cl. 335—179 **11 Claims**

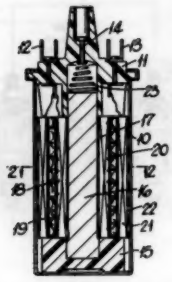


A bistable ball-armature contact having a ball-armature which can be brought to two switching positions by a magnetic flux variation, and which is held in one of the switching positions in the absence of an external magnetic flux by means of at least one permanent magnet for each switching position. The said magnets are polarized in the same direction and encompass the ball-armature, the electrical contacts being formed by two collinear contact strips at one side of the magnets and a supporting strip, situated parallel to the contact strips, for the ball-armature at the other side of the magnets.

3,716,813
IGNITION COILS
Peter Thomas Hillyard, 70 Neville Road, Shirley, Solihull, England
Filed Nov. 23, 1971, Ser. No. 201,466
Claims priority, application Great Britain, Nov. 28, 1970, 56,647/70
Int. Cl. H01f *27/08, 15/14*
U.S. Cl. 336—60 **1 Claim**

An ignition coil has a secondary winding wound on a coil and a primary winding which is co-axial with the secondary

winding and is spaced therefrom by a layer of corrugated electrically insulating material defining a plurality of channels extending parallel to the axis of the core. At least one layer of

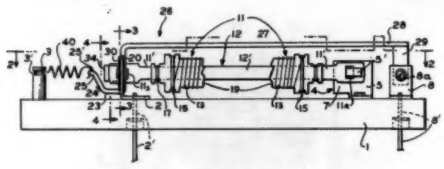


the primary winding is wound on the secondary winding between the secondary winding and the layer of corrugated electrically insulating material.

3,716,814
THERMAL SWITCH

William C. Broekhuysen, 1200 South Ocean Boulevard, Boca Raton, Fla.

Filed Feb. 23, 1972, Ser. No. 228,651
Int. Cl. H01h *61/01*
U.S. Cl. 337—123 **10 Claims**



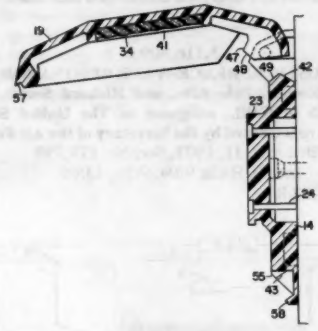
A thermal switch of the type dependent on the differential longitudinal expansion of two separate elongated elements. Contact means to be operated are responsive to the angular orientation of a rocker member, and to that member the two elements are connected to determine that orientation. An appropriate means restrains the rocker member against movement in one direction transverse to the elements, and spring means maintain under tension the restraining means and both the elements. At least one element being subjected to efficient electrical heating, the switch may constitute a thermal relay; neither being so subjected, but the elements being of different thermal expansibilities, the switch may constitute a thermostat.

3,716,815
ELECTRICAL CONNECTORS

Arthur John Riches, 29 Grange Road, Herne Bay, Kent, England

Filed April 5, 1971, Ser. No. 130,959
Int. Cl. H01r *13/44*, *13/50*
U.S. Cl. 339—44 M **8 Claims**

An electrical connector comprising a base of plastics material with a contact carrier upstanding therefrom, and a lid of plastics material hinged to the base and arranged for snap-acting locking closure over the contact carrier, the hinge of

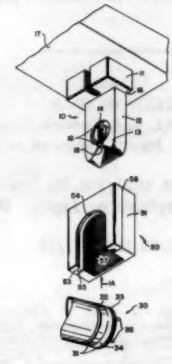


the lid embodying a lost-motion mechanism enabling the lid to move bodily in a direction at right-angles to the base during closure.

3,716,816
COUPLING FOR SECURING A LAMP IN A LAMPHOLDER

William Johnson, Jr., 11346 Wormer, Detroit, Mich.

Filed Dec. 28, 1970, Ser. No. 102,030
Int. Cl. H01r *33/08*
U.S. Cl. 339—53 **5 Claims**



A coupling adaptable to or integral with a lampholder and cooperable with the base of a lamp to prevent relative axial movement of the lamp with respect to the lampholder into which it is inserted.

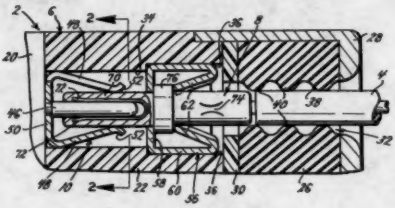
3,716,817
ELECTRICAL CONNECTORS

William D. Wolfe, Jr., St. Louis, and Donald M. Bowdish, Overland, both of Mo., assignors to McDonnell Douglas Corporation, Saint Louis, Mo.

Filed April 21, 1971, Ser. No. 135,911
Int. Cl. H01r *13/62*
U.S. Cl. 339—74 R **7 Claims**

An electrical connection is formed by a pair of connectors which engage one another such that contact resistance

between the two is extremely low. The one connector is attached to a wire and has a hollow barrel surrounded by a flange. The other connector is disposed within a socket and includes a pin sized to fit within a barrel and a plurality of resilient contact fingers spaced around the pin and in electrical contact therewith. When the first connector is inserted



into the socket, the barrel passes over the pin and between the fingers so that the pin engages the internal surface of the barrel while the fingers engage the external barrel surface. The socket contains a locking clip which engages the flange on the barrel and prevents withdrawal of the first connector from the socket.

3,716,818

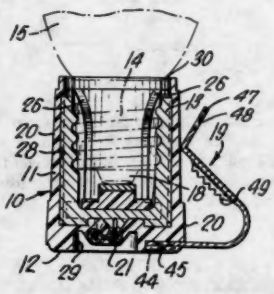
ELECTRICAL HARNESS WITH MOULDED SOCKETS

Laurence Stephen Finkelstein, 42 Lyncroft Road, Montreal, Quebec, Canada

Filed Dec. 21, 1970, Ser. No. 100,342

Int. Cl. H01r 9/08

U.S. Cl. 339—97 L **3 Claims**



A moulded socket for electric lamp bulbs comprising a hollow cylindrical body and an open end. An electrical cable is moulded within a base formed integrally with the cylindrical body. A center metal contact is partly moulded within the base and held at the center of the socket over the base. A U-shape metal side contact having two opposed sides and a connecting base is also partly moulded within the cylindrical body and adapted to receive and retain a lamp bulb screw base between the opposed sides. Points are formed with the contacts to penetrate the insulation on the electrical cable to make electrical connection with a respective wire. The base of the socket is provided with ventilating holes and guide ribs are formed in the inner surface of the cylindrical body to guide a screw base in the socket and to provide sufficient ventilation thereabout. A holding clip is also moulded, at one end thereof, within the socket base.

3,716,819

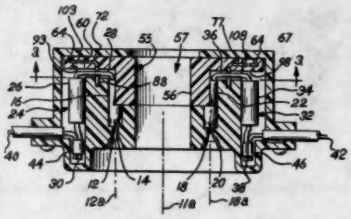
TUBE SOCKET VOLTAGE LIMITING APPARATUS AND METHOD OF MANUFACTURING THE SAME

Anthony Borth, Rural Rt. 1, Morocco, Ind.

Filed April 6, 1970, Ser. No. 25,995

Int. Cl. H01r 13/34

U.S. Cl. 339—143 T **8 Claims**



A voltage limiting apparatus for use in connection with a tube socket comprising a terminal contact adapted to comate with the pin of a tube. The apparatus preferably comprises a conductive member having a first portion adapted to be connected to a ground point and a second portion electrically connected to the contact. A gap is located between the first and second portions. A nonconductive piece of material rigidly positions the first portion with respect to the second portion so that the size of the gap remains constant, thereby causing the voltage at which an electrical discharge occurs across the gap to remain at a predetermined constant value. A method of manufacturing the apparatus includes the steps of fabricating a conductive member with the first and second portions, molding plastic to the conductive member to fix the positions of the two portions and then forming the electrical gap between the portions.

3,716,820

ELECTRICAL JACK PLUGS

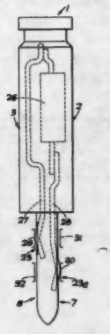
Stanley Thomas Deakin, c/o Sealectro Limited, Walton Road, Portsmouth Hampshire, Farlington, England

Filed May 5, 1971, Ser. No. 140,457

Claims priority, application Great Britain, Jan. 27, 1971, 330/71

Int. Cl. H01r 13/66

U.S. Cl. 339—147 P **1 Claim**



A jack plug is integrally formed and comprises parts which are longitudinally hinged and releasably lock together to form a hollow body, for enclosing an electrical component, and a probe which has passageways for electrical members extending from the component; and the passageways each have an exterior aperture.

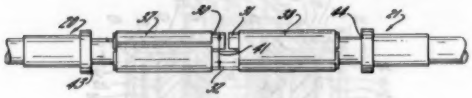
3,716,821
ELECTRICAL CONNECTORS

Arthur I. Appleton, c/o Appleton Electric Co., 1701 West Wellington, Northbrook, Ill.

Continuation-in-part of Ser. No. 770,518, Oct. 25, 1968, abandoned. This application Oct. 20, 1970, Ser. No. 82,452

Int. Cl. H01r 13/16

U.S. Cl. 339—205 **3 Claims**



An electrical connector is provided wherein a male member is inserted into a female assembly, the male member and contacted female assembly parts having substantially identical radii of curvature. Biasing means are provided for urging the contact parts together with a relatively evenly distributed pressure to provide a substantial area of current conducting interface. In the preferred embodiment, the contact parts of the female assembly include an arcuate contact surface which subtends, in cross section, an arc of less than 180°.

3,716,822
METHOD AND DEVICE FOR DETECTING RELATIVE SPEED BY USING SUPERSONIC WAVE

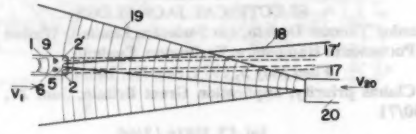
Yasuo Tsuruta, No. 12-22, 3-chome, Nakamagome, Ota-ku, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 74,069

Claims priority, application Japan, Sept. 25, 1969, 44/075803

Int. Cl. G01s 9/66

U.S. Cl. 340—1 R **8 Claims**



A method and device for detecting relative speed by using supersonic wave, wherein the change of cycle due to the Doppler effect of the sound wave reflected from an object moving relative to the sound source of supersonic wave is detected whereby the relative speed of the object is automatically detected and thus the safety mechanism of a transport machine such as an automobile is automatically controlled.

3,716,823
POLYCHROMATIC SONAR OBJECT IDENTIFICATION SYSTEM

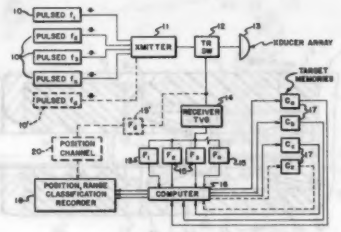
John H. Thompson, Pittsburgh, Pa., and David S. Sims, Ellicott City, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 15, 1960, Ser. No. 76,081

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R **3 Claims**

1. Apparatus for determining whether an underwater object is mine-like in size and construction comprising means for transmitting toward said object acoustic waves in one spectrum having wavelengths extending over the range of circumferential dimensions of expected mines and in another spectrum having wavelengths extending over the range of twice the case thicknesses of expected mines, means for deriving an unknown signal waveform representative of the acoustic wave spectrum back-scattered by said object, and a computer including memory channels in which is stored a library of known signal waveforms representative of the acoustic wave spectra



returned by known mines for comparing said unknown signal waveform with said known signal waveforms and producing an output signal indicating the result of the comparison.

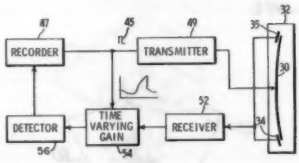
3,716,824
SIDE LOOKING SONAR APPARATUS

John A. Dorr, Crofton Park, and Henry M. Gruen, Annapolis, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1969, Ser. No. 867,170

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R **7 Claims**



An arcuate side looking sonar transducer transmits acoustic energy to the sea bottom. Reflected acoustic energy is received by a pair of relatively short receiver transducers positioned over the ends of the transmitter transducer.

3,716,825
CONTOUR MEASURING APPARATUS ESPECIALLY FOR USE IN A SEA BOTTOM ELEVATION MEASUREMENT

George M. Walsh, Middletown, and Mark A. Chramiec, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

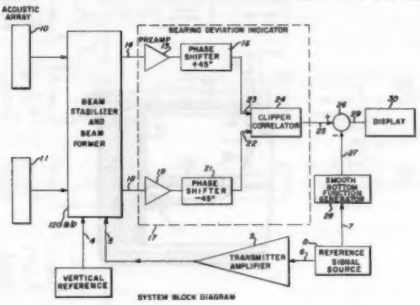
Continuation of Ser. No. 785,102, Dec. 19, 1968, abandoned. This application July 30, 1970, Ser. No. 64,114

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R **8 Claims**

A contour measuring apparatus for determining the elevation of sea bottom features with respect to a reference plane. The apparatus comprises means for projecting a burst of acoustic energy upon a subsurface contour. As the burst leading edge and the following elements roll over the sea bottom, respective portions of the burst will be reflected back at an angle $\psi(t)$ which varies as a function of time. When a sudden elevation is encountered, the reflected portions of the echo pulse are reflected at an angle $\psi(t) + \Delta\phi$. Consequently, the signals detected at spaced transducer phase centers will show a change in their phase relationship within a given time inter-

val. As seen at an acoustic receiver the variations in contour elevation h appear as changes in the angle of arrival $\psi(t)$ as represented by the incremental angle $\Delta\phi$. Thus, the receiver



SYSTEM BLOCK DIAGRAM

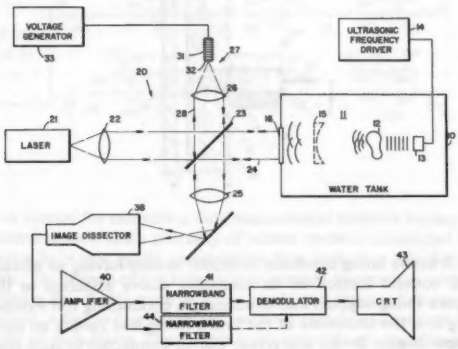
signal representation of $\psi(t)$ for a flat horizontal reference plane must be subtracted from $\psi(t) + \Delta\phi$ in order to determine $\Delta\phi$.

3,716,826

ACOUSTIC TO OPTICAL IMAGE CONVERTER

Philip S. Green, Redwood City, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.

Filed Feb. 2, 1970, Ser. No. 7,486
Int. Cl. G01n *29/00*; H04b *11/00*
U.S. Cl. 340—5 H **7 Claims**



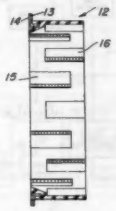
A system for visualizing acoustic wave fields incident on an optically reflective, elastic surface. The elastic surface, upon which an acoustic image is impressed, forms the retroreflector for one of the orthogonal intersecting light beams of a Twyman-Green interferometer which illuminates the entire surface. The light beams are generated from a coherent light source and the reference beam is phase modulated or frequency offset with a light modulator. The recombined intersecting beams are scanned electronically with an image dissector thereby to generate an electrical analog signal including the image information superimposed on a temporal frequency carrier. Desired signal components are selectively filtered and displayed on an electronically addressable optical display.

3,716,827

MOUNTING STRUCTURE FOR SPHERICAL SHAPED UNDERWATER TRANSDUCER

Frank Massa, 280 Lincoln Street, Hingham, Mass.

Filed Aug. 3, 1970, Ser. No. 60,258
Int. Cl. G01v *1/00*
U.S. Cl. 340—8 S **9 Claims**



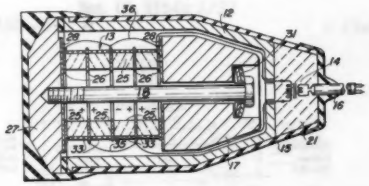
A spherical underwater transducer is flexibly suspended by means of a rubber-like belt equatorially surrounding the sphere. The belt has mounting brackets molded therein and undercut cooling slots formed therein.

3,716,828

ELECTROACOUSTIC TRANSDUCER WITH IMPROVED SHOCK RESISTANCE

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Feb. 2, 1970, Ser. No. 7,606
Int. Cl. H04r *17/00*
U.S. Cl. 340—10 **7 Claims**



An electromechanical transducer assembly comprises a stacked group of axially aligned piezoelectric ceramic rings. Plates, which have a larger diameter than the ceramic rings, are positioned between each of the adjoining faces of the ceramic rings. Therefore, the edges of the plates extend outwardly beyond the periphery of the ceramic rings. A tape or filament is tightly wound about the rim of each ceramic ring to maintain a radial stress upon the ceramic elements.

3,716,829

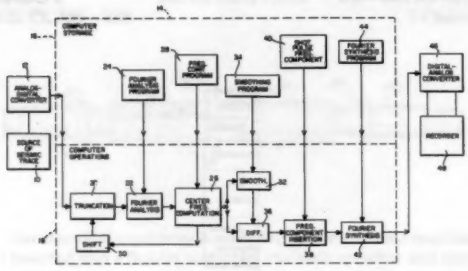
APPARATUS FOR AND METHOD OF TREATING SEISMIC DATA HAVING ATTENUATED HIGH FREQUENCIES

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation

Filed Oct. 30, 1970, Ser. No. 85,631
Int. Cl. G01v *1/36*
U.S. Cl. 340—15.5 DP **8 Claims**

A computer apparatus for and computer performed method of correcting a seismic trace by restoring at-

tenuated high frequency components. The seismic trace is successively truncated, each of the successive truncations is successively Fourier analyzed, and each center frequency of the successive Fourier analyses is computed.



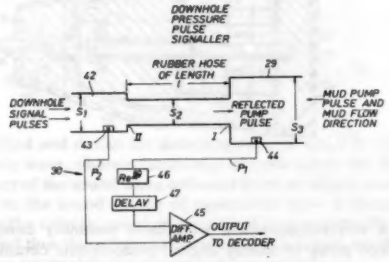
The resulting center frequency function is subjected to smoothing and difference operations followed by insertion of frequency components characteristic of an idealized shot pulse. The corrected seismic trace is then obtained by Fourier synthesis.

3,716,830

ELECTRONIC NOISE FILTER WITH HOSE REFLECTION SUPPRESSION

Donald J. Garcia, 14822 Chadbourne Drive, Houston, Tex.

Filed Dec. 18, 1970, Ser. No. 99,441
Int. Cl. G01v *1/36*
U.S. Cl. 340—18 LD **7 Claims**



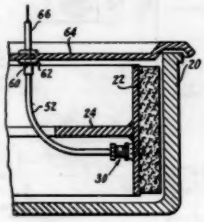
An illustrative embodiment of the present invention includes methods and apparatus for detecting pressure pulse signals from a remote signalling device in the mud line of a well while the well is being drilled and in the presence of mud pump pressure pulse noise. The apparatus and methods include placing plural pressure sensitive transducers in the mud line and at opposite ends of the flexible hose portion thereof between the metallic line from the mud pump and the rotary swivel portion which is attached to the kelly. Electrical transducer signals sensed on the mud pump end of the hose are processed to take into account the amplitude and phase shift effects of the hose and then delayed by a time sufficient for the pulse to traverse the hose. The processed signals are then combined with those from the second pressure transducer to directionally discriminate against the mud pump noise pulses while detecting pulses from downhole.

3,716,831

WORN BRAKE INDICATOR

Jackie D. Rikard, 2529 N. Bell St., and Bobby G. Rikard, Rte. 6, both of Kokomo, Ind. 46901

Filed Mar. 23, 1971, Ser. No. 127,132
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 A **1 Claim**



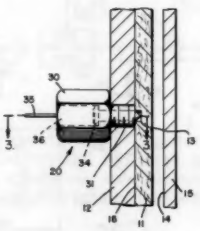
A contact switch assembly mounted to a brake drum and connected to a warning light panel for indication of brake wear when the brake lining wears to a point where the contact switch assembly is exposed to the brake drum.

3,716,832

BRAKE LINING CONDITION INDITOR SYSTEM

Frank J. Gorgie, 9812 La Cresta Circle, Huntington Beach, Calif., and Gene A. Johnson, 2244 East Franzen, Santa Ana, Calif.

Filed April 5, 1971, Ser. No. 131,181
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 A **1 Claim**



A brake lining condition indicator system having an electrical contact formed of an insulating sleeve attached to the brake lining support and containing a conducting rod extending into the underside of the brake lining and having an electrical display device and power source connected to such contact so that when the brake lining wears down and the braking surface contacts such rods the display device is activated.

3,716,833

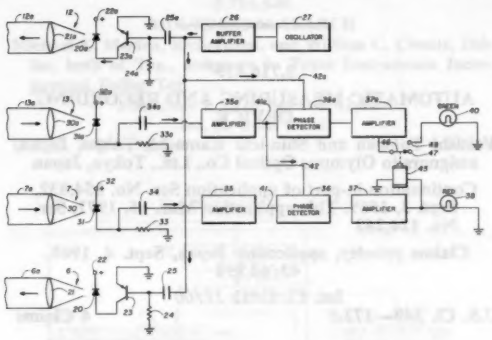
VEHICLE HEIGHT CLEARANCE INDICATING APPARATUS

Irving Roth, Williston Park, N.Y., assignor to Sperry Rand Corporation

Filed Dec. 2, 1971, Ser. No. 204,074
Int. Cl. B60q *1/00*
U.S. Cl. 340—61 **10 Claims**

Cooperating pairs of optical signal devices are employed to protect the higher parts of a motor truck from damage due to

impact with a structure such as a vehicular passage way. Two directive optical radiators are employed, along with associated phase detecting sensor circuits, the radiators being modulated

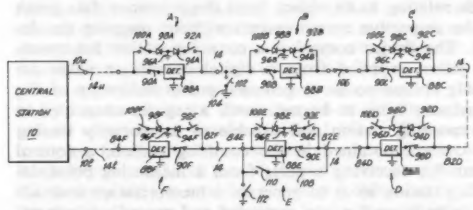


at the same frequency. The relative phase angles of the detected signals identify the relative height of the passage under the canopy, actuating an alarm where the canopy is too low in comparison to the highest part of the motor vehicle.

3,716,834
DATA TRANSMISSION SYSTEM WITH IMMUNITY TO CIRCUIT FAULTS

Henry G. Adams, Llewellyn park, West Orange, N.J.

Filed Oct. 7, 1971, Ser. No. 187,284
Int. Cl. G08b *29/00;* **H04q** *5/00*
U.S. Cl. 340—147 R **9 Claims**



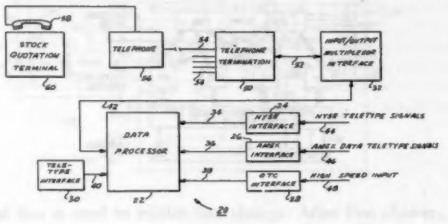
A system for use with a data transmission network having a central station and a plurality of remote stations connected in series by a low grade transmission line such as a telephone pair. The system of the invention is immune to common transmission line faults, such as a line to ground short, a line open circuit, a line to line short, etc. and will continue to operate in spite of such faults. The system is also capable of identifying a transmission line fault when it occurs, the nature of the fault, and the approximate location of the fault in the network.

3,716,835
PERSONAL STOCK QUOTATION SYSTEM

Harold Weinberg, Villanova; Marvin E. Rogers, Feasterville; Michael G. Dadario, Philadelphia, and James A. Benson, Huntingdon Valley, all of Pa., assignors to Sonex, Inc., Philadelphia, Pa.

Filed March 19, 1971, Ser. No. 126,224
Int. Cl. H04m *11/00;* **H04q** *9/00*
U.S. Cl. 340—154 **8 Claims**

A personal stock quotation system having a data processing system with a memory having stored therein stock market information relating to a plurality of corporations is provided. The data processing terminal is connected to telephone terminal lines. A stock quotation terminal is provided which has a cradle for a telephone handset. The quotation terminal further includes a coupling means adjacent the cradle, signalling means for generating address and control signals for

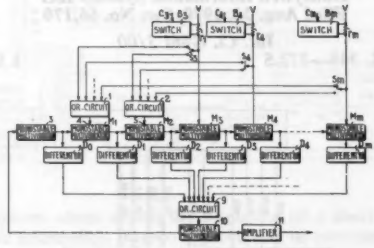


obtaining the stock information and display means for displaying the stock information obtained from the data processing system. Further features of the stock quotation terminal are touch keys which are utilized for signalling different combinations representative of corporations about which stock information is required.

3,716,836
DATA CODE CONVERSION FOR REMOTE SIGNALLING AND CONTROL SYSTEMS

Raymond Jacquet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 14, 1971, Ser. No. 143,477
Claims priority, application France, May 22, 1970, 7018767
Int. Cl. H04q *1/32*
U.S. Cl. 340—167 R **5 Claims**



A message is formed by the output pulses successively delivered by a chain of $(m+1)$ monostable multivibrators, the first one delivering a synchronizing pulse of duration 3T, the other m ones (the time constant of which is made equal to T or $3T/2$ according to the binary signal to be transmitted) delivering the information pulses. When a message has been transmitted a feed back loop triggers the transmission of a further message.

The decoder comprises a synchronizing pulse detector and a chain of m bistable multivibrators controlled by the received signals to restitute the pulses generated in the coder by the first m monostable multivibrators, and m circuits for detecting the duration of these pulses.

3,716,837

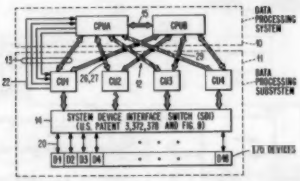
INTERRUPT HANDLING

James M. Waddell, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1971, Ser. No. 136,429

Int. Cl. G06f *15/16, 9/18*

U.S. Cl. 340—172.5 15 Claims



A multi-unit data processing system provides communication between the various units by sets of data lines with associated control (tag) lines. The control lines carry signals for initiating, controlling, monitoring, and terminating transmissions over the data lines which may contain bytes of data or sets of command signals. All of the communication links are asynchronous, one with the other. Interconnection of the units enables a plurality of units in a first set to service and communicate with any one unit in a second set of units. The second set of units provides selective communication paths between units in a first and third set. The third set units may selectively provide interrupt signals to any one of the second set units. The disclosure teaches timing and lockout provisions for multiple interrupt and multiple unit handling of a single interrupt.

3,716,838

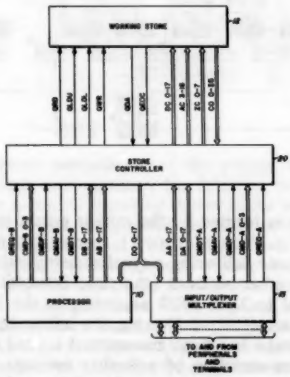
DATA PROCESSING SYSTEM WITH SELECTIVE CHARACTER ADDRESSING OF SYSTEM STORE

Albert Le Messurier Beard, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.

Filed Aug. 24, 1970, Ser. No. 66,170

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 1 Claim



A multiprocessor data processing system, wherein a plurality of processors are provided access to the system store through a central controller, and wherein the controller automatically responds to each address supplied by a processor to provide for the transfer of a data character between the processor and a particular portion of a data word storage cell represented by said address.

3,716,839

AUTOMATIC MEASURING AND RECORDING DEVICE

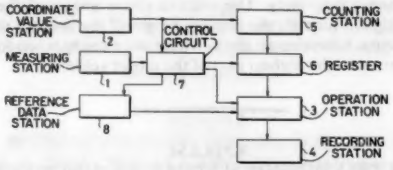
Yasushi Totsuka and Shin-ichi Kamachi, Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 854,832, Sept. 3, 1969. This application Mar. 15, 1971, Ser. No. 124,262

Claims priority, application Japan, Sept. 4, 1968, 43/62,998

Int. Cl. G01b *11/00*

U.S. Cl. 340—172.5 4 Claims



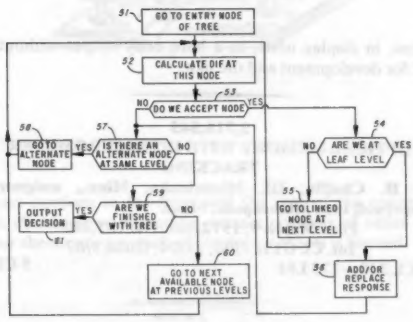
Automatic measuring and recording device capable of successively measuring and recording the errors or the deviations of measured values such as the length and the angle relating to an object from the reference data given in the respective measurements without stopping the device. The device comprises a counting station for counting pulses supplied from a digital coordinate value detecting station so as to generate pulses indicative of the coordinate value to be measured, a register connected to the counting station and capable of temporarily storing the content obtained in the counting station, a control circuit for receiving a pulse from a measuring point detecting station so as to generate a memorization instructing pulse as well as an operation and recording instructing pulse in synchronism with the pulses counted in the counting station, an operation station and a recording station connected to the register and the control circuit, a reference data setting station connected to the control circuit and the operation station, the control circuit being connected to the digital coordinate value detecting station as well as the register, the reference data setting station supplying the reference dataum to the operation station each time the control circuit supplies a pulse to the reference data setting station. The register receives the content of the counting station at the moment the memorization instructing pulse from the control circuit is applied thereto during the time the counting station continues the counting operation so as to temporarily store the content of the counting station. The content stored in the register is transferred to the operation station while the reference datum is supplied thereto from the reference data setting station by the application of the operation and memorization instructing pulse from the control circuit within the time period until the next pulse is supplied from the measuring point detecting station so that the content transferred from the register is compared with the reference datum to provide the deviation of the measured value in the object from the refer-

ence datum. The thus obtained deviation is successively recorded in the recording station by the operation and recording instructing pulse.

3,716,840
MULTIMODAL SEARCH

Michael K. Masten, Richardson, and William C. Choate, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,429
Int. Cl. G06f *15/18*
U.S. Cl. 340—172.5 **4 Claims**


GO TO ENTRY NODE OF TREE
CALCULATE DIF AT THIS NODE
DO WE ACCEPT NODE
NO
YES
GO TO ALTERNATE NODE
IS THERE AN ALTERNATE NODE AT SAME LEVEL
ARE WE AT LEAF LEVEL
OUTPUT DECISION
ARE WE FINISHED WITH TREE
GO TO LINKED NODE AT NEXT LEVEL
GO TO NEXT AVAILABLE NODE AT PREVIOUS LEVELS
ADD/OR REPLACE RESPONSE

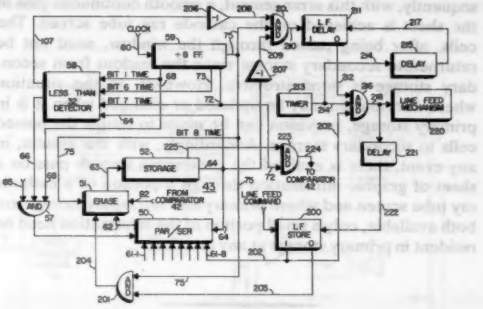
A trained processor is described which operates beyond an untrained point. Information is stored in a memory array in a tree-allocated file. Information is stored in the memory as key functions with associated trained responses. After the processor has been trained, it is able during an execution cycle, to find appropriate responses for query key functions. These query key functions are compared with the reference key functions stored in the memory array to find an appropriate trained response. During the execution cycle, there are some query keys for which there is no corresponding reference key function stored in the memory array, therefore, no readily apparent appropriate trained response for the query key. These query key functions for which there is no readily apparent trained response are termed untrained points. Thereupon a query key function which constitutes an untrained point is effectively compared with the reference key functions stored in the memory array to establish and store a difference function for stored reference key functions. Logic means then selects for the untrained point a trained response from those trained responses best satisfying a predetermined decision criteria. During the comparison operation, conditions are measured that indicate when reference key functions corresponding to a given group of trained responses cannot be an appropriate response for the untrained point in question. Logic means waive further examination of some stored reference key functions thereby greatly expediting the efficiency of search. In the multimodal search there are several modes of search, each mode further defining the item being searched.

3,716,841
LINE FEED-PRINT INHIBIT SYSTEM

Clifford M. Jones, 601 Meadowview Cove, Waynesboro, Va.

Continuation of Ser. No. 734,468, June 4, 1968, abandoned.
This application Dec. 7, 1970, Ser. No. 95,967
Int. Cl. G06k *1/00*
U.S. Cl. 340--172.5 **17 Claims**

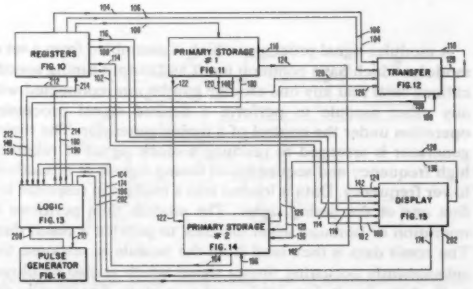
An end-of-line print control system for a printer identifies those characters received after receipt of a line change command and inhibits printout of the identified characters until previously stored characters are printed and line change is accomplished. The presence of characters to be printed on the old line is used to inhibit line change. After line change, an erase gate eliminates the identification of new line characters permitting their printout.



3,716,842
SYSTEM AND METHOD FOR THE CONTINUOUS MOVEMENT OF A SHEET HAVING GRAPHIC SUBJECT MATTER THEREON THROUGH A WINDOW OF A DISPLAY SCREEN

Laszlo Antal Belady, Yorktown Heights; Carlo John Evangelisti, Jefferson Valley, and Robert Ingersoll Roth, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1971, Ser. No. 140,477
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **15 Claims**


REGISTERS FIG. 10
PRIMARY STORAGE # 1 FIG. 11
TRANSFER FIG. 12
LOGIC FIG. 13
PRIMARY STORAGE # 2 FIG. 14
DISPLAY FIG. 15
PULSE GENERATOR FIG. 16

A system which effects the displaying of a sheet having graphic information thereon by achieving its movement in a continuous pass through a window on the screen of the cathode ray tube of a program controlled display unit. To accomplish this, the sheet to be displayed is divided into an orthogonal grid of square cells of a chosen area. There is provided appropriate storage of each of the cells which contains graphic subject matter therein such as the X, Y, coordinates of the cell and the display orders pertinent thereto. Such cellular structure and storage may conveniently be termed "pre-scissoring." By the use of appropriate registers, the information on the sheet is then displayed in a window of the screen by a continuous pass therethrough. Where there is available both primary and secondary storage, all of the cellular information can be contained in secondary storage and only a small portion thereof need be retained in primary storage, i.e., the cells being displayed in the window presently and cells abutting the displayed cells. Where there is available both primary and

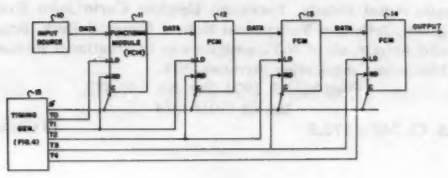
secondary storage, as cells are passed through the window, there are concurrently brought from secondary storage, cells which follow immediately upon those in primary storage. Consequently, with this arrangement, a smooth continuous pass of the sheet is achieved on the cathode ray tube screen. The cells, after being passed through the window, need not be returned to secondary storage since the readout from secondary storage is nondestructive. However, in the situation where information may be updated or changed when it is in primary storage, provision can be made to return the passed cells to secondary storage. Accordingly, with this system, in any event, there is enabled the continuous smooth pass on a sheet of graphic information through a portion of a cathode ray tube screen and where primary and secondary storage are both available, only a small portion of the information need be resident in primary storage at any one time.

3,716,843

MODULAR SIGNAL PROCESSOR

Joseph W. Schmitt, Hudson, and Donald L. Starkey, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 8, 1971, Ser. No. 206,070
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **4 Claims**



A modular signal processor which is assembled from a set of modules which have common input and output timing specifications such that any one module can be interconnected with any other module to perform a desired signal processing operation under the control of a timing generator. The timing generator is arranged to produce a clock signal of relatively high frequency and sequences of timing signals at a relatively lower frequency. Data is loaded into a module in response to a first one of the timing signal. The module then performs its operation or function upon the data to provide a result data. The result data is then read from the module in response to a subsequently occurring timing signal which is also employed to load the result data into another module. Specifically disclosed herein is a frequency synthesizer processor which employs the following modules: binary coded decimal to binary converter, phase accumulator, look up table and a digital to analog converter and filter.

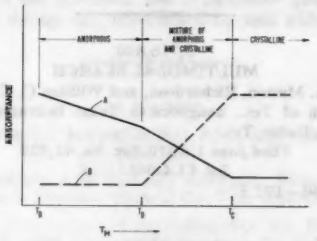
3,716,844

IMAGE RECORDING ON TETRAHEDRALLY COORDINATED AMORPHOUS FILMS

Marc H. Brodsky, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 29, 1970, Ser. No. 59,172
Int. Cl. G11c *13/02*, *13/04*; G01d *15/14*
U.S. Cl. 340—173 LS **19 Claims**

An image can be recorded on a layer of an amorphous material such as Si, Ge, or SiC, by using a beam of electrons or light to locally heat the amorphous material in a predetermined pattern. The image can be optically observed directly after recording or can be reproduced from the transparency. The invention can be used in beam addressable memory



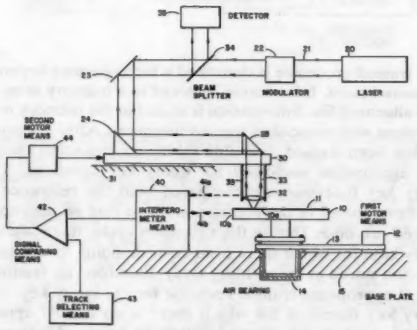
devices, in display units, as a hard copy output without the need for development and the like.

3,716,845

OPTICAL MEMORY WITH INTERFEROMETER TRACKING

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 9, 1972, Ser. No. 233,201
Int. Cl. G11c *7/00*, *13/04*; G03b *5/02*
U.S. Cl. 340—173 LM **5 Claims**



An optical mass memory utilizing a rotatable substrate is provided with improved tracking. An interferometer measures the distance between a reflective edge surface on the rotatable substrate and a reflective surface on a movable arm. The final lens for focusing the read-write light beam to a focused light spot on the memory medium is mounted on the movable arm. The electrical signal produced by the interferometer is compared to a track selection signal which is indicative of the desired distance between the reflective edge surface and the reflective surface, and a servo control signal is produced which is indicative of the difference of the electrical signal and the track selection signal. The movable arm is positioned in response to the servo control signal.

3,716,846

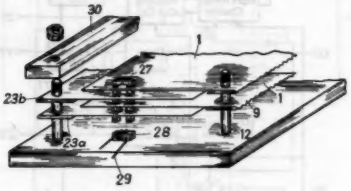
CONNECTOR SHEET WITH CONTACTS ON OPPOSITE SIDES

Peter Volckart, Haagstrasse 18a, 6451 Bruchkopel; Hartmut Lehmann, Weilerstrasse 5, 7741 Burgberg, and Raimund Hafner, Zimmerstrasse 18, 722 Dauchingen, all of Germany

Filed Jan. 18, 1971, Ser. No. 107,366
Claims priority, application Germany, Jan. 24, 1970, P 30 03 225.1
Int. Cl. G11c *11/02*; H05k *1/00*
U.S. Cl. 340—174 M **13 Claims**

A connector sheet or band with a printed circuit or other conductors only on the front face, has a marginal portion bent

along a fold line upon the rear surface. Input and output connectors extending across the fold line are arranged symmetrical to the same and form registering electrically connected



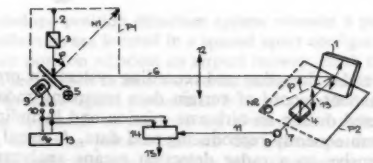
contact portions in the front and the rear of the connector sheet abutting corresponding contact portions of other connector sheets when a stack of connector sheets is formed.

3,716,847

MIRROR UTILIZED IN MAGNETO-OPTICAL READOUT SYSTEM TO ELIMINATE FRESNEL EFFECT

Jean Valin, 78 - Les Essarts Le Roi, France, assignor to Compagnie Internationale pour L'Informatique, Louveciennes, France

Filed May 24, 1971, Ser. No. 146,188
Claims priority, application France, June 10, 1970, 7021267
Int. Cl. G11c *11/42, 11/14*
U.S. Cl. 340—174 YC **11 Claims**



A metallic ferromagnetic layer recording binary bit information is read-out by a device utilizing the Kerr effect. A metallic reflector mirror is provided upstream of the layer and its magnetic material is saturated along one at least of the directions of magnetization significant of one of the binary values of the bit memory points in said layer.

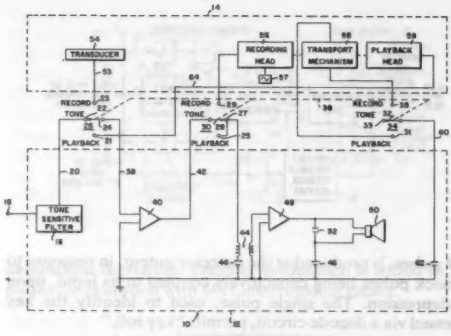
3,716,848

SMALL PORTABLE PAGING RECEIVER WITH AUDIO RECORDING AND REPRODUCING FACILITIES

George J. Schonholtz, Rockville, and Eugene J. Pawlikowski, Silver Spring, both of Md., assignors to said Schonholtz, by said Pawlikowski

Filed Nov. 23, 1970, Ser. No. 91,925
Int. Cl. G11b *31/00;* **H04n** *11/02*
U.S. Cl. 340—311 **7 Claims**

A paging receiver has recorder-playback features compactly arranged in a single and easily transportable unit. A three-position mode selector switch has its brushes arranged to operate, in unison, selectively to positions which permit a



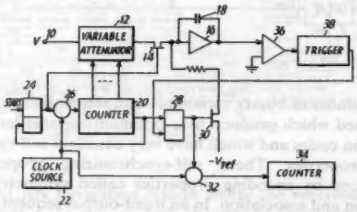
means of amplification common to all modes irrespective of the mode selected.

3,716,849

INTEGRATING MEASUREMENTS WITH NOISE REDUCTION

Eric Metcalf, c/o The Solartron Electronic Victoria Rd., Farnborough, England

Filed June 8, 1970, Ser. No. 44,077
Claims priority, application Great Britain, June 10, 1970, 29,432/70
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 NT **17 Claims**



Noise rejection in an integrating type of analogue to digital converter is improved by effecting the integration in accordance with a variable weighting function, preferably a step function. Functions are described which flatten the response versus frequency curve in the neighborhood of the zeroes and introduce more zeroes into this curve. The weighting may be introduced by scaling either on the analogue side or the digital side of the instrument.

3,716,850

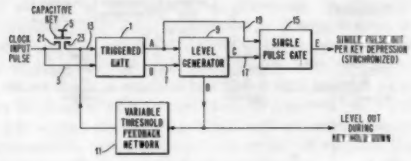
SYNCHRONOUS DETECTOR FOR MONOPULSE KEY SAMPLING ELECTRONIC KEYBOARD

Donald E. Fisher, Wappingers Falls, and Peter Pleshko, Kotonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1971, Ser. No. 210,427
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 E **10 Claims**

A synchronous detector for monopulse key sampling in electronic keyboards. A variable threshold feedback network

prevents false sampling due to signal distortions caused by "key bounce," and the like. A single output pulse, in synchronism with and of the same time duration as system

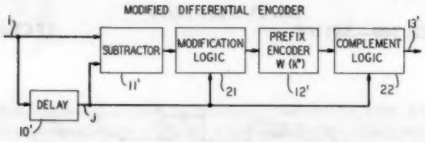


clock pulses, is produced at the detector output, in response to the clock pulses being capacitively coupled to its input, upon key depression. The single pulse, used to identify the key depressed via a decode circuit, permits "key roll."

3,716,851
SELF-SYNCHRONIZING SEQUENTIAL ENCODING SYSTEMS

Peter Gabriel Neumann, Rye, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1971, Ser. No. 113,905
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD **9 Claims**



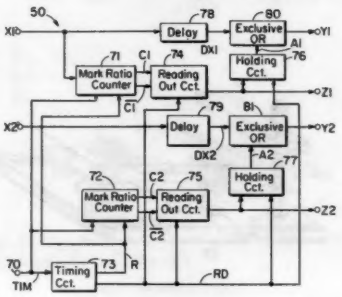
A number of binary variable-length sequential encoders are disclosed which produce near optimum variable-length compression codes and which have very excellent self-synchronizing properties. These self-synchronizing properties are enhanced by encoding properties called symmetry, columnization and association. In an input-output sequential encoding matrix, symmetry refers to the number of mutual reflections, complementations and rotations of a common code kernel. Columnization refers to the property of having each column of codes end in the same digit. Association refers to the property of allowing each code word to correspond to very few (possibly one) inputs.

3,716,852
CODE CONVERSION CIRCUIT FOR A TWO-LEVEL TO MULTI-LEVEL CODE CONVERTER

Akira Sawai, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 25, 1972, Ser. No. 118,671
Claims priority, application Japan, March 5, 1970, 45/19174
Int. Cl. H03k *13/24*
U.S. Cl. 340—347 DD **2 Claims**

A two-level to multi-level code converter includes a first portion for determining which pattern of *n*-digit two-level code inputs has the greatest occurrence frequency, and a second portion for converting the input codes to *n*-digit output codes in response to the outputs of the determining portion so

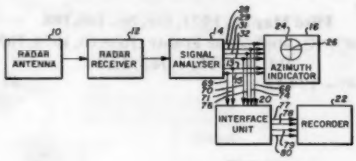


that the frequency of occurrence of the two-level code corresponding to the maximum level of the multi-level code is the highest of the two-level output codes.

3,716,853
AIRBORNE RADAR DETECTING AND RECORDING SYSTEM

Robert J. La Follette, Santa Clara, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 13, 1969, Ser. No. 876,275
Int. Cl. G01s *7/04*
U.S. Cl. 343—5 PR **9 Claims**



A radar detection and recording system for providing a permanent record of certain data regarding radar signals detected during an airborne mission and including means for subsequently reproducing said data. A signal analyzer responsive to a radar detection means analyzes the detected signals and divides them into component signals which are suitable for driving an azimuth indicator means. The component signals are sampled and modified by an interfacing means which converts the signals normally used to energize the indicator means into a coded form suitable for recording on a plural channel magnetic recording device. The recorded signals may then subsequently be utilized to reconstruct the signals originally used to drive the airborne indicator means.

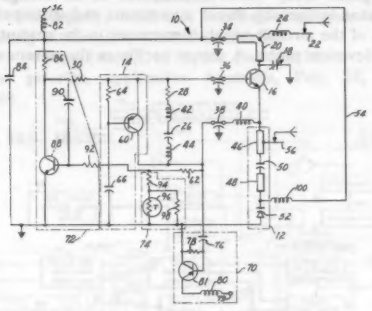
3,716,854
RADAR DETECTOR

Lincoln H. Charlot, Jr., Tampa, Fla., assignor to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed July 1, 1970, Ser. No. 51,542
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 PD **8 Claims**

A pulsed radar detector the repetition rate of which is a function of the phase of the feedback signal in the radio frequency (rf) oscillator which produces the pulse of rf energy. A phase-shift circuit which makes the phase of the feed-

back signal essentially independent of the detector's environment, and a pulse spectrum limiter circuit which limits the



pulse of energy to a relatively narrow spectrum of frequencies are disclosed.

3,716,855

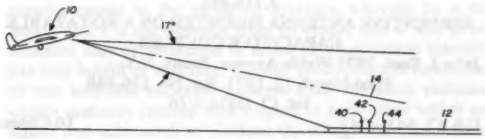
GLIDESLOPE POSITION DETECTION SYSTEM FOR USE WITH AN INDEPENDENT AIRCRAFT LANDING MONITOR

Edward F. Asam, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1970, Ser. No. 55,164

Int. Cl. G01s *9/16*; H01q *15/14*

U.S. Cl. 343—5 LS **13 Claims**



An glideslope position detection system wherein a pair of passive reflectors are located in a spaced apart configuration at a known position adjacent an airport runway. Each of the reflectors are shaped to direct different reflection patterns in response to radar signals transmitted from an aircraft during a glideslope approach to the runway. One of the reflectors directs a reflection pattern beneath the glideslope and the other of the reflectors directs a radar reflection pattern above the glideslope, the reflection patterns providing equal amplitude radar returns to an aircraft traveling along the glideslope. The aircraft carries a radar system for detecting the relative radar return signal amplitudes from the two reflectors. Circuitry is responsive to comparison of the radar return signal amplitudes from the reflectors to generate indications of the position of the aircraft relative to the runway glideslope.

3,716,856

POLARIZATION ADAPTIVE MTI RADAR TRANSPONDER

Daniel Edmond Beguin, Saint-Prix, France, assignor to International Standard Electric Corporation, New York, N.Y.

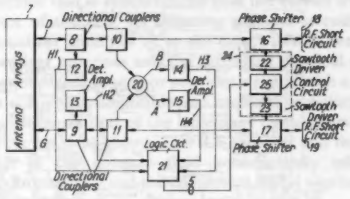
Filed Oct. 6, 1971, Ser. No. 186,899

Claims priority, application France, Oct. 8, 1970, 7036372

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.8 LC **7 Claims**

A transponder beacon for use with a coherent pulse-Doppler radar. The transponder antenna system includes a pair of separately, mutually orthogonally polarized antenna channels. Interrogation pulses are analyzed as to polarization and the polarization of the replies is appropriately automatically



determined therefrom. Doppler modulation is added to reply pulses for operation with MTI interrogating radars.

3,716,857

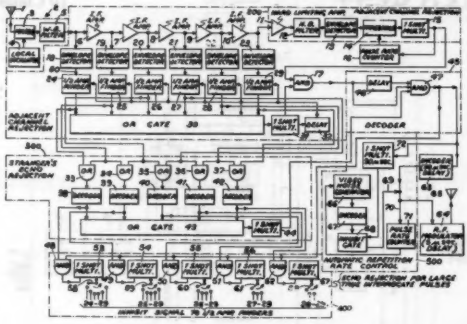
A NAVIGATION SYSTEM UTILIZING PULSE TIMING

Jesse S. Le Grand, Clifton, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 27, 1970, Ser. No. 93,209

Int. Cl. G01s *7/28*

U.S. Cl. 343—6.8 LC **7 Claims**



In a TACAN navigation system where the received interrogate signals are pulse pairs of substantially equal amplitude, but the amplitude of different pairs may vary widely, pulse timing is utilized to generate response signals. To provide apparatus which is capable of determining the time of arrival of each interrogate pulse regardless of amplitude, the pulses are provided to a plurality of serially connected IF amplifiers, and a half amplitude finder, responsive within selected amplitude limits, is connected to the output of each of said amplifiers, the output of the half amplitude finders providing a timing pulse related to the time of arrival of each of the interrogate pulses.

3,716,858

DISTANCE MEASURING SYSTEM

William Douglas Worthington, Bramhall, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

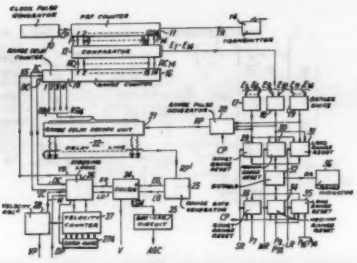
Filed Apr. 6, 1971, Ser. No. 131,725

Int. Cl. G01s *9/14*

U.S. Cl. 343—7.3 **9 Claims**

Distance measuring system employs a radar or similar source to produce a return signal from a target. Digital

techniques are employed to produce and maintain a predetermined time relationship between the return signal and a variable gating pulse produced by the equipment. A distance indication is given when this predetermined time relationship is established.



3,716,859

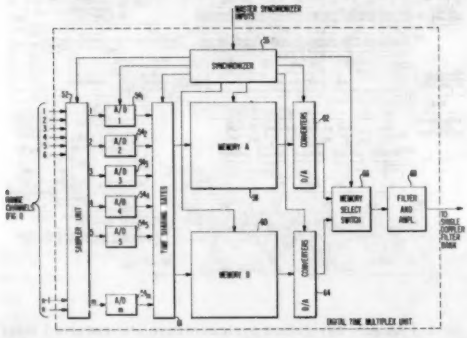
TIME MULTIPLEXER FOR HIGH PRF PULSE DOPPLER RADAR

William R. Webb, 405 Oak Forest Avenue, Catonsville, Md.; William S. Jones, 2102 Ferndlen Way, Baltimore, Md., and Robert E. Hendrix, 209 Winchester Road, Annapolis, Md.

Filed Oct. 27, 1970, Ser. No. 84,304

Int. Cl. G01s 9/42

U.S. Cl. 343—7.7 **10 Claims**



A digital time multiplexer for use in combination with a high PRF range gated pulse doppler radar which eliminates the need for a doppler filter bank for each range gated receiver in the system. The outputs of n range gated receivers are respectively sampled at the Nyquist rate or faster, converted into a digital signal, and fed into a memory unit on a time shared basis. The data is then sequentially read out of the storage on a per receiver basis into a single doppler filter bank for spectral analysis of the doppler band.

3,716,860

INDEPENDENT AIRCRAFT LANDING MONITOR SYSTEM

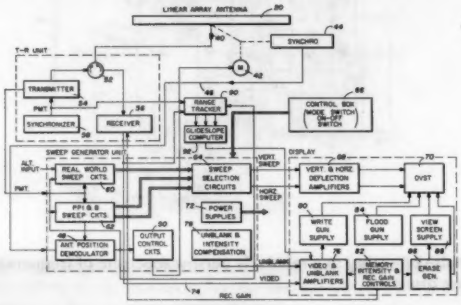
Bartow Bechtel, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1970, Ser. No. 54,979

Int. Cl. G01s 7/12, 7/16, 9/06

U.S. Cl. 343—11 R **22 Claims**

An aircraft landing monitor which is independent of ground-based guidance systems and which includes an antenna comprising an elongated housing pivotally mounted about a vertical axis for horizontal movement in the forward portion of an aircraft. The housing supports an edge-slotted waveguide array which is mounted in an elongated horn reflector to thereby direct an antenna radiation pattern forward of the aircraft which is narrower in the azimuth than in the elevation plane. A motor oscillates the antenna housing about the vertical axis to sweep over an azimuth angle sufficient for airport runway detection during a glideslope approach to the runway by the aircraft. Radar transmitter and receiver circuits transmit and receive pulse radar signals via the antenna for radar detection of the runway. A radarscope mounted in the cockpit control panel is responsive to the radar transmitter and receiver for visually displaying an approaching airport runway in real-world linear perspective.



3,716,861

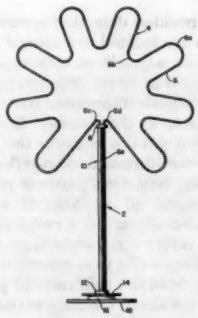
SERPENTINE ANTENNA MOUNTED ON A ROTATABLE CAPACITIVE COUPLER

John J. Root, 3875 Waldo Avenue, Bronx, N.Y.

Filed March 22, 1971, Ser. No. 126,448

Int. Cl. H01q 9/16

U.S. Cl. 343—741 **10 Claims**

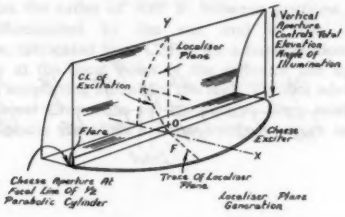


This disclosure teaches an antenna including a conductor disposed in a serpentine arrangement defined by a plurality of undulations, wherein the amplitude or size of the undulations determines the directivity of the antenna, and wherein the undulations function to cancel mutual inductance parameters of the antenna while increasing the capacitive reactance thereof, to yield broadband characteristics. The antenna can take a variety of shapes, as for example the undulations may all fall entirely in a common plane and generally define a circle, a square, or an ellipse, etc.; or, such undulations may be arranged to form a ring or other three-dimensional object. The said shape of the antenna and its disposition with the earth's surface also contribute to the directivity of the antenna.

3,716,862
GENERATION OF NAVIGATING PLANES FOR AIRCRAFT LANDING UTILIZING PARABOLIC CHEESE AERIAL

Eric O. Willoughby, Adelaide, Australia, assignor to The University of Adelaide, Adelaide, Australia

Filed Feb. 24, 1970, Ser. No. 13,470
Claims priority, application Australia, Feb. 24, 1969, 50970/69
Int. Cl. G01s 1/14
U.S. Cl. 343—108 R **8 Claims**



An aerial system for aircraft instrument landing wherein a symmetrical parabolic cheese aerial fed from two excitation centers symmetrical about the focus produces aperture illuminations with variations substantially of the form

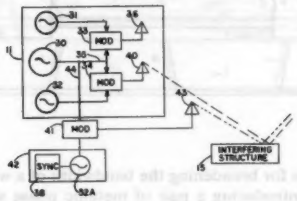
$$C \cos \pi x/a \cos^2 \pi x/2a$$

and $D \sin \pi x/a \cos^2 \pi x/2a$
simultaneously in the radiating aperture, wherein 2a is the length and x is the distance from its center and C and D are constant factors measured in terms of illumination intensity per unit length of aperture, thereby producing the equivalent of two identical radiation patterns from the same radiation center mutually rotated with respect to each other which are added and subtracted to produce the navigation information, and with their excitation systems in the same plane.

3,716,863
INSTRUMENT LANDING ERROR CORRECTING SYSTEM

Rabindra N. Ghose, Los Angeles, and Walter A. Sauter, Malibu, both of Calif., assignors to American Nucleonics Corp., Woodland Hills, Calif.

Filed Aug. 6, 1970, Ser. No. 61,566
Int. Cl. G01s 1/16
U.S. Cl. 343—108 R **11 Claims**

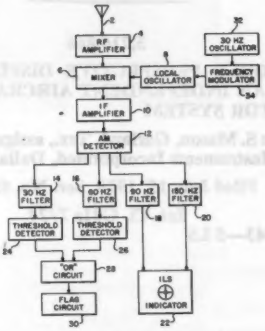


A system is disclosed for automatically reducing antenna radiation pattern errors of the localizer beams of instrument landing systems (ILS) commonly used in the United States of America and elsewhere to assist in landing of aircraft. The system is designed to produce a signal which cancels the error resulting from reflections from physical objects illuminated by the localizer antenna which otherwise would displace the ILS localizer null line of position. The system employs a correction signal generator that is synchronized with the carrier frequency generator of the ILS. Its radiating antenna is collocated with the localizer antennas or in the direct line between the runway localizer antennas and the reflecting physical object. The correction signal generator provides a signal with a modulation that is equal in amplitude and opposite in polarity and phase coherent with that of the dominant signal illuminating the reflecting physical object. The ILS receiver and the landing aircraft in the antenna field automatically adds the reflected dominant ILS and the correction signal algebraically resulting in the elimination of the error.

3,716,864
ILS RECEIVER FOR AIRCRAFT WITH DISTORTION WARNING OR ELIMINATION

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed March 25, 1971, Ser. No. 127,989
Int. Cl. G01s 1/16
U.S. Cl. 343—108 R **19 Claims**



Means for improving the reliability of instrument landing system receivers is disclosed. Filtering techniques detect predetermined harmonics of the basic tone-pair employed in such systems, which harmonics are present in response to heretofore undetected amplitude and frequency distortions which give rise to erroneous output guidance signals. The detection principles lead to receiver design approaches by means of which guidance signal immunity to these distortions may be realized.

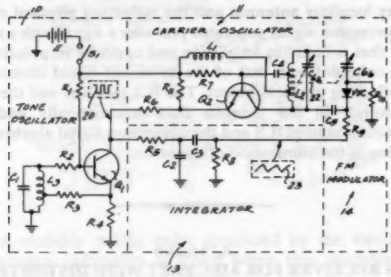
3,716,865
RADIO CONTROLLED SYSTEM FOR GARAGE DOOR OPENER

Colin B. Willmott, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.

Filed June 10, 1971, Ser. No. 151,862
Int. Cl. H04b 1/04, 7/00
U.S. Cl. 343—225 **5 Claims**

A closure operator including a simultaneously and synchronously pulsed and frequency modulated transmitter for use in conjunction with a remote receiver for controlling a closure operator and in which the range of control is substan-

tially increased over prior art transmitters. By frequency modulating the pulse output of the transmitter, more energy will be received by the receiver without exceeding the radiation limits as established by the Federal Communications



Commission thus allowing greater range. The circuit also utilizes a split stator type tuning capacitor in the transmitter which provides for a relatively constant frequency deviation component over a wide RF carrier tuning range.

3,716,866

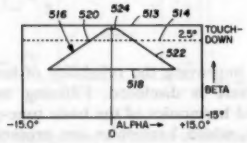
REAL-WORLD PERSPECTIVE DISPLAY FOR USE WITH AN INDEPENDENT AIRCRAFT LANDING MONITOR SYSTEM

James S. Mason, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1970, Ser. No. 55,166

Int. Cl. G01s 7/24

U.S. Cl. 343—5 LS **25 Claims**



A radar display for an independent aircraft landing monitor wherein a radar system onboard an aircraft detects an airport runway during glideslope approach. The display includes a radar display tube having horizontal and vertical sweep circuits for controlling the visual display of the tube. Circuitry operates the horizontal sweep circuits of the display tube in synchronism with the azimuth scan of the radar system. Circuits are responsive to the aircraft altitude for generating a driving output signal which varies non-linearly in amplitude with respect to the ratio of aircraft altitude and radar range. Circuitry is responsive to the driving output signal for control of the elevation angle displayed by the vertical sweep circuits of the radar display tube to thereby generate indications of the approaching airport runway in real-world perspective. Provision is also made to selectively display conventional B sweep or PPI displays of the approaching airport runway, and range marker signals are displayed upon the radar display tube during glideslope approach.

3,716,867

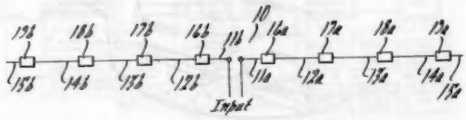
WIRE ANTENNA MULTIPLY-LOADED WITH ACTIVE ELEMENT IMPEDANCES

Paul E. Mayes, 1508 Waverly Dr., Champaign, Ill., and Andrew J. Poggio, 863 Palomino, Pleasanton, Calif.

Filed Aug. 11, 1970, Ser. No. 62,910

Int. Cl. H01q 11/04

U.S. Cl. 343—701 **10 Claims**



This invention relates to antennas and more particularly to a wire antenna which is multiply-loaded to provide wide band characteristics. By virtue of its novel construction and design, the antenna of this invention will maintain an input impedance value which changes very little over an extended frequency band. Furthermore, single beam omnidirectional radiation patterns can be maintained over a wide band.

3,716,868

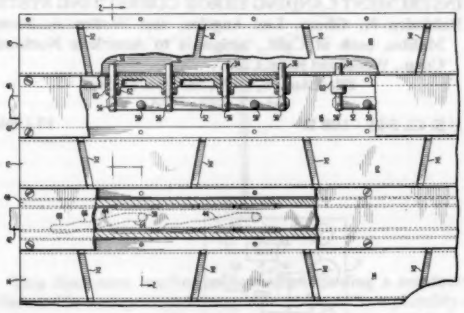
BROADBAND SLOTTED WAVEGUIDE ANTENNA ARRAY

Hall R. McComas, Laurel, and John H. Staehlin, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1970, Ser. No. 82,446

Int. Cl. H01q 13/10

U.S. Cl. 343—768 **10 Claims**



A means for broadening the bandwidth of a waveguide slot array by introducing a pair of metallic phase shifter probes between adjacent radiating slots located in the feeding waveguide. The probes are made to penetrate to specific depths within the waveguide thereby effectively restoring the electrical phase between the slots and tuning the array whenever the operating frequency substantially deviates from a predetermined frequency which determines the slot spacing.

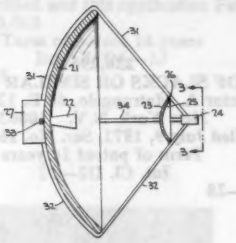
3,716,869

MILLIMETER WAVE ANTENNA SYSTEM

William I. Gould, Jr., Silver Spring, and Jack Evans, Baltimore, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 2, 1970, Ser. No. 94,369
Int. Cl. H01q 19/14
U.S. Cl. 343—779 12 Claims

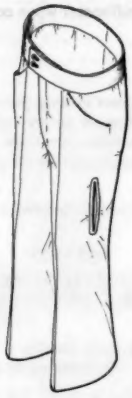
A millimeter wave antenna mounted on a satellite includes a parabolic reflector fabricated of carbon fiber reinforced plastic (CFRP) composite material to enable the parabolic shape of the reflector to be maintained to within three percent of a millimeter wave length despite possible temperature variations on the order of 300° F. between portions of the reflector illuminated by the sun and in the umbra. Waveguides, fabricated from CFRP, for a feed positioned approximately at the focal point of the reflector are the sole mechanical supporting means for the feed. To take advantage of the physical properties of the carbon fiber reinforced plastic composite materials a honeycomb structure is sandwiched between layers of the CFRP. The surface of the reflector illuminated by the feed is coated with a thin film of aluminum which functions as a millimeter wave reflector. The waveguide CFRP interior is coated with a thin film of aluminum to provide the millimeter wave conducting surface.



DESIGNS

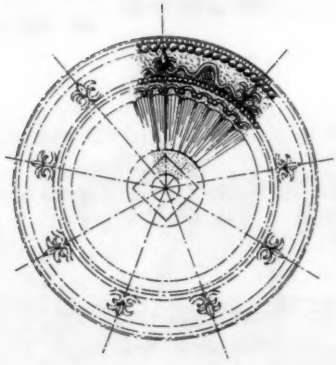
FEBRUARY 13, 1973

226,295
PAIR OF SLACKS OR SIMILAR ARTICLE
Victor A. Matrangelo, 60 E. 12th St., New York, N.Y. 10003
Filed July 9, 1971, Ser. No. 161,428
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

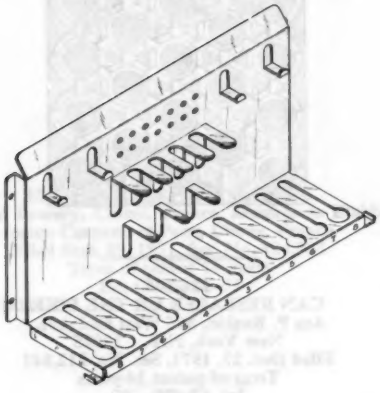


226,296
SUPPORT BRACKET FOR A BATHROOM FIXTURE OR THE LIKE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,060
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86

226,297
ESCUTCHEON PLATE FOR A BATHROOM FIXTURE OR THE LIKE
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Mar. 31, 1971, Ser. No. 130,061
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86

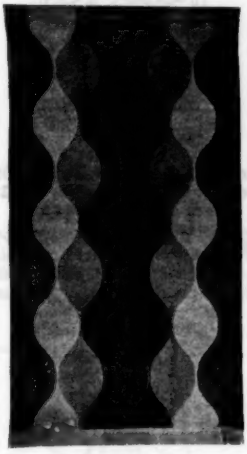


226,298
STORAGE RACK FOR A SET OF MACHINE TOOLS
Robert F. Anderson, 3613 13th St., Menominee, Mich. 49858
Filed Dec. 11, 1970, Ser. No. 26,417
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125

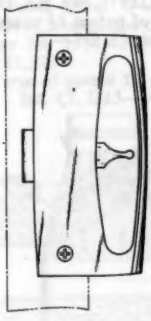


226,299
TROUSER HANGER
Robert L. Gielow, 320 Indian Trail, Marietta, Ga. 30060
Filed May 19, 1971, Ser. No. 145,119
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

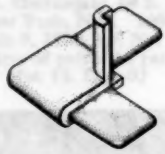
226,300
TEXTILE FABRIC
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Original design application Feb. 16, 1971, Ser. No. 115,908. Divided and this application Feb. 2, 1972, Ser. No. 223,062
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—265



226,301
SLIDING DOOR HANDLE
Raymond N. Dushane, Jr., 932 Sandalwood, Fullerton, Calif. 92632
Filed July 12, 1971, Ser. No. 161,396
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—151

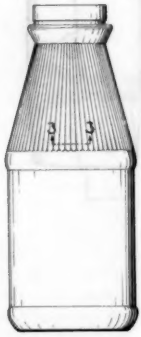


226,302
CORNER INSERT FOR CEILING TRACKS
Melvin W. Tompkins and George F. Retz, New Castle, Ind., assignors to American Standard Inc., New York, N.Y.
Filed May 11, 1971, Ser. No. 142,426
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—225

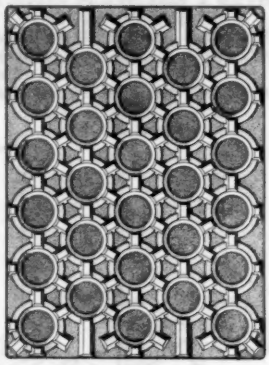


226,303
BOTTLE
Edward J. Kretz, 2120 Marlow, Toledo, Ohio 43606
Filed Oct. 6, 1971, Ser. No. 187,233
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66

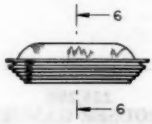
226,304
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 6, 1971, Ser. No. 187,229
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—125



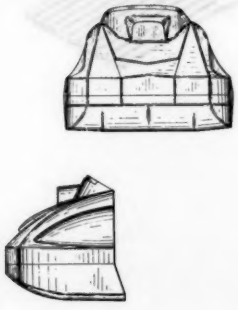
226,305
PACKAGING TRAY
Lawrence T. Wilkes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 7, 1971, Ser. No. 132,250
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—188



226,306
CAN RESEALER OR THE LIKE
Asa P. Ruskin, 865 West End Ave., New York, N.Y. 10025
Filed Dec. 27, 1971, Ser. No. 212,847
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—282

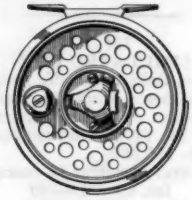


226,307
HOOD FOR SNOWMOBILE
Gaston Marier, 50 Mailhot St., Princeville, Quebec, Canada
Filed Mar. 29, 1971, Ser. No. 129,296
Claims priority, application Canada Jan. 6, 1971
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24



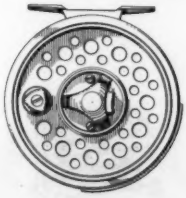
226,308
ARROW RELEASE DEVICE
Ross A. Pinti, 1106 Roemer Blvd., Farrell, Pa. 16121, and Patrick R. Pinti, 62 Stiver St., Hubbard Township, Ohio 44425
Filed July 15, 1971, Ser. No. 163,143
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

226,309
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,984
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

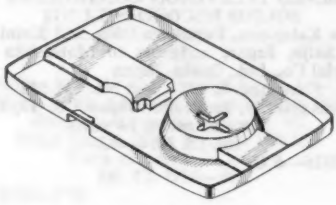


226,310
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,986
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

226,311
FLY CASTING FISHING REEL
Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano et Pons, Cluses, France
Filed Sept. 29, 1971, Ser. No. 184,987
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



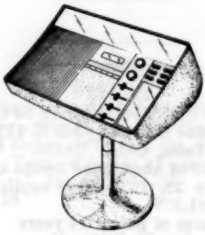
226,312
BRINE CABINET INNER BOTTOM
Robert E. Marsh, Milwaukee, Wis. (5521 Willow View Road, Racine, Wis. 53402)
Filed Feb. 8, 1971, Ser. No. 113,809
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



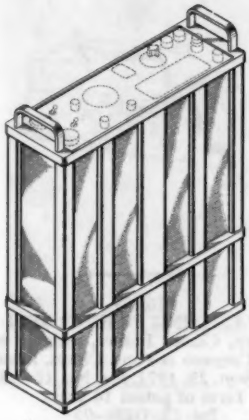
226,313
COVER FOR LAVATORY SPOUT
Ralph La Rue Du Bois, 4242 E. 111th St., Tulsa, Okla. 74135
Continuation-in-part of abandoned design application Ser. No. 23,112, May 25, 1970. This application July 12, 1971, Ser. No. 161,379
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

226,314
ARTIFICIAL HEARTH FIRE
Robert Conroy, San Francisco, Kellogg Fleming, Sausalito, Burton Hirsch, San Mateo, Ray Redel, Albany, and J. B. Steinhilber, Mill Valley, Calif., assignors to Fred Meyer of California
Filed July 12, 1971, Ser. No. 161,397
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—94

226,315
COMBINED TELEVISION CONTROLLER AND SOUND RECORDING UNIT
Masaharu Katayama, Fumiharu Ohta, and Kumi Yanagisawa, Saijo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 5, 1971, Ser. No. 131,591
Claims priority, application Japan Oct. 13, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



226,316
CASING FOR PORTABLE RADIO TRANSCEIVER
Stanford Seiden, North Miami Beach, Fla., assignor to Sunair Electronics, Inc., Fort Lauderdale, Fla.
Filed Dec. 30, 1971, Ser. No. 214,524
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L



226,317
SIMULATED COIN
Stanley F. Dann, Oakland, Calif., assignor to World Commerce, Vacaville, Calif.
Continuation-in-part of design application Ser. No. 25,752, Oct. 30, 1970. This application June 21, 1971, Ser. No. 155,387
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D29—11 F

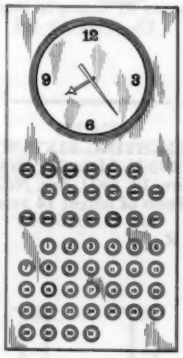
226,318
PLAYGROUND CLIMBING BARS
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.
Filed June 4, 1971, Ser. No. 150,258
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

226,319
GOLF PUTTER HEAD
Ronald D. Sanders, 232 Saddle Road, Trinidad, Colo. 81082
Filed June 4, 1971, Ser. No. 150,266
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

226,320
TOY LOCOMOTIVE
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., Hicksville, N.Y.
Filed June 10, 1971, Ser. No. 148,944
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM

226,321
COMBINED CHECKER AND CHESSBOARD
David Aiuppa, W207 S8286 Hillendale Drive, Muskego, Wis. 53150
Filed Aug. 16, 1971, Ser. No. 172,368
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

226,322
COMBINED CLOCK AND PERPETUAL CALENDAR
Franklin M. Wills, Chicago, Ill., assignor to Burwood Products Company, Chicago, Ill.
Filed Aug. 4, 1971, Ser. No. 169,169
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7 H



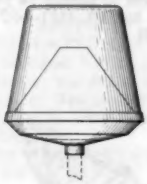
226,323
FOOD SERVING DISH
Ralph P. Wilton, Wrightsville, Pa., assignor to Wilton Brass Company, Columbia, Pa.
Filed Apr. 20, 1971, Ser. No. 135,822
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10

226,324
TABLE LAMP
Giuseppe Longato, Via Makalle 19, Padova, Italy
Filed May 3, 1971, Ser. No. 139,990
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

226,325
LIGHTING FIXTURE
Richard B. Poff, 743 N. Main St., Auburn, Ind. 46706
Filed Nov. 12, 1971, Ser. No. 198,487
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

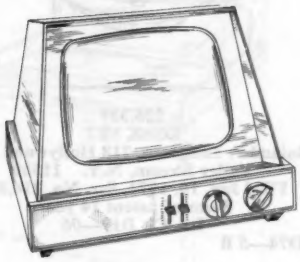
226,326
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Dec. 9, 1970, Ser. No. 26,369
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

226,327
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Jan. 10, 1972, Ser. No. 216,912
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



226,328
COVER FOR TRASH RECEPTACLE
Milburn P. Patton, 20 Devonshire Road, Ypsilanti, Mich. 48197, and David Denski, 10471 Territoral, Plymouth, Mich. 48170
Filed Oct. 20, 1971, Ser. No. 191,148
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—35

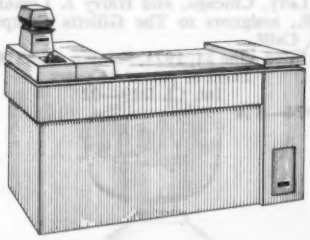
226,329
PORTABLE TELEVISION RECEIVER, OR SIMILAR ARTICLE
George Peter Roegner, Short Hills, N.J., assignor to U.S. Industries, Inc., New York, N.Y.
Filed June 1, 1971, Ser. No. 149,128
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



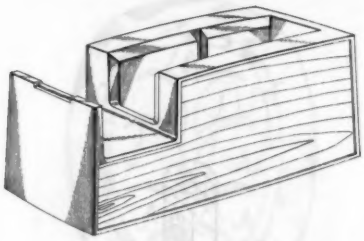
226,330
CAMERA FLASH ATTACHMENT
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of design applications Ser. No. 18,974 and Ser. No. 18,981, both Sept. 3, 1969. This application June 5, 1970, Ser. No. 23,340
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1 F

226,331
ELECTRONIC PHOTOFLASH UNIT
Robert M. Hogue, 4425 W. Dunwood Road, Brown Deer, Wis. 53223, and Donald N. Emmerich, Glendale, Wis.; said Emmerich assignor to said Hogue
Continuation of design application Ser. No. 21,768, Mar. 6, 1970. This application July 12, 1971, Ser. No. 161,377
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F

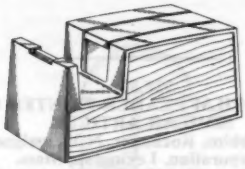
226,332
MICROFILM READER-PRINTER OR SIMILAR ARTICLE
Daniel H. Robbins, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.
Filed Sept. 23, 1971, Ser. No. 183,296
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



226,333
TAPE DISPENSER
Jean O. Reinecke, Pasadena, Calif., and Geno C. D'Ercoli, Park Forest, and Michael S. Joss, Skokie, Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 26, 1971, Ser. No. 192,687
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1

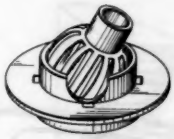


226,334
TAPE DISPENSER
Jean O. Reinecke, Pasadena, Calif., and Geno C. D'Ercoli, Park Forest, and Michael S. Joss, Skokie, Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 26, 1971, Ser. No. 192,688
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



226,335
COMBINED PAPERWEIGHT AND PENHOLDER
Leon M. Levy, Chicago, and Harry J. Lemanski, Glenview, Ill., assignors to The Gillette Company, Santa Monica, Calif.
Filed June 21, 1971, Ser. No. 155,378
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A

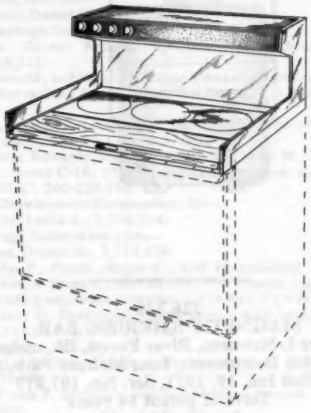
226,336
BALL JOINTED PEN HOLDER AND THE LIKE
Roland P. Longarzo, Valley Stream, N.Y., assignor to Ibex Precision Products, Inc., New York, N.Y.
Filed Nov. 15, 1971, Ser. No. 201,632
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



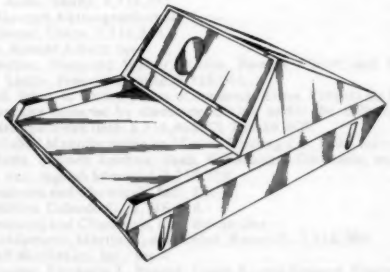
226,337
DESK SET
Roland P. Longarzo, 218 Hollywood Ave., Valley Stream, N.Y. 11580
Filed Jan. 10, 1972, Ser. No. 216,877
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—5 B

226,338
CASING FOR A WRITING INSTRUMENT
Peter L. Tailer, 323 E. 17th St., New York, N.Y. 10003
Filed Oct. 9, 1970, Ser. No. 25,415
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

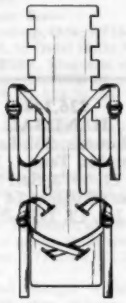
226,339
COMBINED COOKTOP AND VENTILATING HOOD WITH WARMING SHELF OR SIMILAR ARTICLE
Bohdan Hurko, Louisville, Ky., assignor to General Electric Company
Filed Feb. 16, 1971, Ser. No. 115,940
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—25 E



226,340
VIEWER FOR AN ELECTROPHORESIS CASSETTE
Bernard R. Danti, Lexington, and Paul E. Brefka, Southboro, Mass., assignors to Millipore Corporation, Bedford, Mass.
Filed Apr. 1, 1971, Ser. No. 130,560
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1



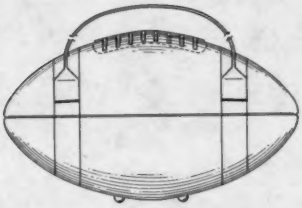
226,341
SHORT SPINE BOARD
Chester V. Rhoads, 5221 Hadley Court, Apt. 4, Shawnee Mission, Kans. 66202
Filed July 8, 1971, Ser. No. 160,965
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 E



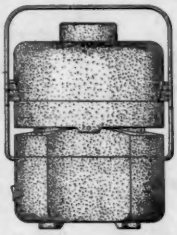
226,342
ASH TRAY OR SIMILAR ARTICLE
Frank J. Curran, 3250 S. Highland Ave., Downers Grove, Ill. 60515
Filed May 20, 1971, Ser. No. 145,592
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2 H

226,343
HANDLE FOR AN ELECTRIC HAIR STYLER OR THE LIKE
Denis J. Jordan, Eau Claire, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.
Filed Aug. 26, 1971, Ser. No. 175,425
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

226,344
HANDBAG
Judith J. Loomis, 232 Lafayette St., Memphis, Tenn. 38111
Filed Jan. 11, 1972, Ser. No. 217,083
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



226,345
AUTOMATIC JUICE MAKER
Jurgen Greubel, Eschenhahn, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 25, 1970, Ser. No. 26,153
Claims priority, application Germany July 1, 1970
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1 A



226,346
MAGNETIC STIRRING BAR
Alexander I. Newman, River Forest, Ill., assignor to Lab-Line Instruments, Inc., Melrose Park, Ill.
Filed Jan. 19, 1971, Ser. No. 107,877
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D94—3 D

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Olliges, James R., Sr., 3,715,898.

AB Tetra Pak: *See—*
Tuma, Alex; and Hansson, Jan Ingvar, 3,716,083.

Abel's Bagels, Inc.: *See—*
Fronczak, Daniel H., 3,715,857.

Abruzzi, Pierluigi: *See—*
Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.

Acker, Ellsworth; and Winyall, Milton Edward, to Grace, W. R., & Co. Process for making fine sized low density silica. 3,716,493, Cl. 252-317.000.

Ackerman, Irving. Envelope-type package for fold-over type coffee filter sheets. 3,716,131, Cl. 206-57.000.

Ackrell, Jack; Edwards, John A.; and Fried, John H., to Syntex Corporation. Novel C-16, 17 spiro-orthoester steroids and preparation. 3,716,529, Cl. 260-239.55d.

Acoustics Development Corporation: *See—*
Hannula, Leslie A., 3,716,214.

Active Garage Builders Inc.: *See—*
Monroe, Donald G., 3,715,836.

Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., to Smith Klint, & French Laboratories. Coccidiostat compositions and methods using aminobenzonitriles. 3,716,641, Cl. 424-251.000.

Adams, Henry G. Data transmission system with immunity to circuit faults. 3,716,834, Cl. 340-147.00r.

Adams, Heribert: *See—*
Koenig, Walter; Adams, Heribert; and Heidjann, Franz, 3,716,104.

Addison, Frank F. Surface controlled blowout arrester. 3,716,068, Cl. 137-67.000.

Addressograph-Multigraph Corporation: *See—*
Gogola, Joseph K., 3,716,364.

Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, to Bosch, Robert, G.m.b.H. Fuel injection control apparatus for internal combustion engines. 3,716,035, Cl. 123-32.0ea.

Adler, Stuart L.: *See—*
Lange, Henry F.; and Adler, Stuart L., 3,716,258.

Adlhart, Otto J.; and Terry, Peter L., to Engelhard Minerals & Chemicals Corporation. Fuel metering device for fuel cell. 3,716,416, Cl. 136-86.00b.

Adriaan, Hendrik; and Battaerd, Jacobs, to ICI Australia Limited. Thermal regeneration ion exchange process with triallylamine polymers. 3,716,481, Cl. 210-32.000.

Advance Management Engineering & Research Co.: *See—*
Long, Larry K., 3,716,292.

Aerco Corporation: *See—*
Angelery, Henry W.; and Mohr, glenn R., 3,716,719.

Aerojet-General Corporation: *See—*
King, William M., 3,716,315.

African Wire Ropes Limited: *See—*
Reynolds, Robin Francis Norman, 3,716,069.

Aga-Aktiebolag: *See—*
Almqvist, Hans O.; and Backlund, Sigurd A., 3,716,053.

Agatsuma, Kunio: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,716,583.

Agfa-Gevaert Aktiengesellschaft: *See—*
Riester, Oskar, 3,716,366.

Ahern, Ronald Albert: *See—*
Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, 3,716,062.

Ahmad, Iqbal, to United States of America, Army. Process for forming composite material by electrodeposition under the influence of a centrifugal force field. 3,716,461, Cl. 204-16.000.

Ahmedabad Manufacturing and Calico Printing Co., Ltd.: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Air Products and Chemicals, Inc.: *See—*
Molina, Orlando G., 3,716,494.

Air Products and Chemicals, Inc., mesne: *See—*
Lindemann, Martin K.; and Volpe, Rocco P., 3,716,504.

Aircraft Mechanics, Inc.: *See—*
Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,716,264.

Aisin Seiki Kabushiki Kaisha: *See—*
Kobayashi, Toyoaki; Sakakibara, Naoji; and Kondo, Toshio, 3,716,113.
Nishida, Koji, 3,716,788.

Ajinomoto Co., Inc.: *See—*
Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, 3,716,453.

Akachi, Hisateru, to Oki Densen Kabushiki Kaisha. Communication cable. 3,715,877, Cl. 57-156.000.

Akiba, Keiichiro: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.

Aktiebolaget Celleco: *See—*
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Aktiebolaget Electrolux: *See—*
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Aktieselskabet Niro Atomizer: *See—*
Masters, Keith; and Straarup, Orla, 3,716,193.

Akulov, Nikolai Sergeevich, to Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR. Magnetic spring-controlled winding apparatus for gauging the thickness of non-magnetic coatings on metal products. 3,716,779, Cl. 324-34.0tk.

Akutsu, Hidezo: *See—*
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.

Albers, Henry John; Riggi, Stephen Joseph; Bach, Frederick Louis; and Cohen, Elliott, to American Cyanamid Company. Hypolipidemic agents. 3,716,644, Cl. 424-308.000.

Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud, said Albrecht and said Schroder assors. to Schering A.G. 5-Nitro-furfurylidene antimicrobic agents. 3,716,531, Cl. 260-240.00a.

Alburger, William P.: *See—*
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Alburn, Harvey E.; and Fletcher, Horace, III, to American Home Products Corporation. 1,3-diazaspiro[4,4]non-7-ene-2,4-dione. 3,716,553, Cl. 260-309.500.

Aldrich Chemical Company, Inc.: *See—*
Hopps, Harvey B.; Jackman, Dennis; and Biel, John H., 3,716,539.

Alexandrovich, Eduard-Gely Vitalievich: *See—*
Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.

Alfa-Laval AB: *See—*
Clark, Reginald Thomas, 3,716,376.

Alfredsson, Alf Ingvar, to Victor, Fritz. Preset diaphragm for interchangeable lenses of single-lens mirror reflex cameras. 3,715,965, Cl. 95-64.00b.

Alfrey, Turner, Jr.: *See—*
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Allan, William L., to United States of America, Army. Aerial surveillance and fire-control system. 3,715,953, Cl. 89-36.00m.

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Baybrook, Howard E.; and Chivinsky, Joseph A., 3,716,691.
Houze, Gerald L., Jr.; and Osborn, Merlin L., 3,716,763.
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Little, Edwin D.; and Hirsch, Clarence A., 3,716,554.
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Allis-Chalmers Corporation: *See—*
Larson, Dale E., 3,716,772.

Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., to International Business Machines Corporation. Magnetoresistive sensing device for detection of magnetic fields having a shape anisotropy field and uniaxial anisotropy field whichare perpendicular. 3,716,781, Cl. 324-46.000.

Almqvist, Hans O.; and Backlund, Sigurd A., to Aga-Aktiebolag. Breathing apparatus. 3,716,053, Cl. 128-142.200.

Alonso, Jose Luis, to Figueras, Alfredo, Jr. Head massage machine. 3,716,048, Cl. 128-49.000.

Altherr, Russell George, to Amsted Industries Incorporated. Slack adjuster for railway car couplers. 3,716,146, Cl. 213-75.00r.

Altshuler, Judif Markovna: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich;

Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Amada Co., Limited: *See—*
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American Express Investmant Management Company: *See—*
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American Filtrona Corporation, mesne: *See—*
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American Home Products Corporation: *See—*
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AMF Incorporated: *See—*
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Anaconda Wire and Cable Company: *See—*
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Anderson, Amos R., to Packo, Joseph J., mesne. Compositions for sealing leaks in vessels. 3,716,384, Cl. 106-33.000.

Anderson, Ernest Leslie, to South African Inventions Development Corporation. Purification of crystallizable material by directional freezing. 3,715,892, Cl. 62-58.000.

Anderson, Lloyd L.; and Bildahl, Richard L., to Amerock Corporation. Universal roller bracket assembly for drawers. 3,716,279, Cl. 308-3.800.

Anderson, Lowell Ray: *See—*
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Anderson, Robert James, to Rust Furnace Company. Heating furnace. 3,716,222, Cl. 432-133.000.

Anderson, Roger Y. Aquatic sediment and pollution monitor. 3,715,913, Cl. 73-61.00r.

Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, to Ibigawa Electric Industry Co., Ltd. Method of manufacturing a resinous decorative laminate having a lustrous pattern of really metallic surface. 3,716,440, Cl. 156-277.000.

Ando, Hiei, to American Cyanamid Company. n-Succinimide additives for azide imaging systems. 3,716,367, Cl. 96-91.000.

Andrews, David; and Saucy, Gariel, to Hoffmann-La Roche Inc. Selective allylic oxidation process. 3,716,561, Cl. 260-345.900.

Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company, mesne. Slitting machine. 3,715,941, Cl. 83-7.000.

Angelery, Henry W.; and Mohr, glenn R., to Aerco Corporation. Modulated output transformers. 3,716,719, Cl. 307-17.000.

Anker-Werke AG: *See—*
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Anner, Georg; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. Pharmaceutical preparations. 3,716,637, Cl. 424-243.000.

Anner, Georg; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. 6-Methyl-19-nor-progesterone and a process of its manufacture. 3,716,638, Cl. 424-243.000.

Aoi, Katashi. Apparatus for purifying gases. 3,715,867, Cl. 55-222.000.

Aono, Shunji: *See—*
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Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Impact fuze for projectiles. 3,715,989, Cl. 102-84.000.

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Appleton, Arthur I. Electrical connectors. 3,716,821, Cl. 339-205.000.

Apromat, Incorporated: *See—*
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Aranar Marketing Services, Inc.: *See—*
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Arbeitsstelle fur Molekularelektronik: *See—*
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Armstrong Cork Company, mesne: *See—*
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Armstrong, William A., to Basic Packaging Systems, Inc., mesne. Method and apparatus for automatically venting plastic bags. 3,715,855, Cl. 53-37.000.

Arnold Engineering Company, The: *See—*
Hirai, Robert K.; Boomer, John H.; and Small, Edward R., 3,715,943.

Arrey, Kelly J., to Canadian National Railway Company. Longitudinal and lateral retainer and guide assembly for containers on a vehicle bed. 3,716,268, Cl. 296-35.00a.

Arrow Hart Inc.: *See—*
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Asam, Edward F., to Texas Instruments, Incorporated. Glideslope position detection system for use with an independent aircraft landing monitor. 3,716,855, Cl. 343-5.01s.

Ashburn, Dillion P., to New Products Corporation. Internal combustion engine exhaust catalytic reactor. 3,716,344, Cl. 23-288.00f.

Asnani, Gul C.: *See—*
Harries, William S.; Asnani, Gul C.; and Flentie, John H., 3,716,791.

Aspland, John Richard, to Martin-Marietta Corporation. Dyeing cotton or regenerated cellulose using sulfur dyes oxidized with aqueous sodium bromite solution. 3,716,325, Cl. 8-37.000.

Ateliers Roannais de Constructions Textile: *See—*
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Atomic Energy of Canada Limited: *See—*
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Aung, Tin; and Boyle, William M., Jr., to Dow Chemical Company, The. Delignification and bleaching of cellulose pulp with oxygen and alkali in the presence of magnesium chloride inhibitor. 3,716,447, Cl. 162-65.000.

Auric Corporation: *See—*
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Avery-Hardoll Limited: *See—*
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Ayer, James C., to Ingersoll Milling Machine Company, The. Rotary cutter with helical blades. 3,715,788, Cl. 29-103.00a.

Ayerst, McKenna and Harrison Limited: *See—*
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Bailey, Ernest Arthur: *See—*
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Bailey, John E., to Foxboro Company, The. Magnetic flowmeter apparatus. 3,715,918, Cl. 73-194.0em.

Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., to Email Limited. Lid latch for washing apparatus. 3,716,122, Cl. 192-136.000.

Baker, Robert L.; and Szlosberg, Edward, to Phillips Fibers Croporation. Process for antistatically treating articles. 3,716,393, Cl. 117-47.00r.

Balini, Andrew, to Bell & Howell Company. Frame count cuer for continuous photographic film printer. 3,716,299, Cl. 355-83.000.

Ball, David C.: *See—*
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Banic, Carl V.: *See—*
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Barman, Rolf. Method of manufacturing toothpicks. 3,716,086, Cl. 144-326.00r.
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Barron, William J., to Graphic Electronics, Inc. Engraving machine. 3,716,668, Cl. 178-6.60b.
Barrow, Gilbert C., to Massa Division, Dynamics Corporation of America. Piezoelectric transducer having spider-like frame structure. 3,716,681, Cl. 179-110.00a.
Bartell, Maurice J., to Berko Hydraulics, Inc. Device for positioning liner plates upon the interior surface of a drum for securement thereto. 3,716,153, Cl. 214-91.000.
Barth, David Edward, to Sybron Corporation. Overbed table. 3,715,997, Cl. 108-146.000.
Bartlow, Aulden H., to Hendrick Manufacturing Company. Screen having parallel slots and method. 3,716,144, Cl. 210-499.000.
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Bateman, James R. Feeding arrangement for shredding and bagging device. 3,716,089, Cl. 56-501.000.
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Battocock, Whalley Vowe, to Coal Industry (Patent) Limited. Solid fuel combustion systems. 3,716,003, Cl. 110-28.00j.
Bauer, Donald J.; Haskett, Philip R.; and Lindstrom, Ronald E., to United States of America, Interior. Process for the production of cuprous oxide. 3,716,615, Cl. 423-35.000.
Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, to Sued-West-Chemie GmbH. Process of producing pigmented, a hardenable resin containing paper sheets, and products. 3,716,395, Cl. 117-68.000.
Baybrook, Howard E.; and Chivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Shielded arc welding with austenitic stainless steel. 3,716,691, Cl. 219-137.000.
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Beard, Albert Le Messurier, to Honeywell Information Systems, Inc., mesne. Data processing system with selective character addressing of system store. 3,716,838, Cl. 340-172.500.
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Becker, Herbert, to Farbwerke Hoechat Aktiengesellschaft vormals Meister Lucius & Bruning. Mixture of a radioactive tracer substance and a propellent for marking drilling tools for deep wells and similar boreholes. 3,716,426, Cl. 149-38.000.
Becker, Rudolf, to Knorr-Bremse GmbH. Apparatus for sorting elongated articles. 3,716,123, Cl. 193-40.000.
Beeli, Johann Battesta, to International Telephone and Telegraph Corporation. Television camera tube having channel multiplier surrounding electron gun. 3,716,738, Cl. 313-65.00r.
Beguin, Daniel Edmond, to International Standard Electric Corporation. Polarization adaptive MTI radar transponder. 3,716,856, Cl. 343-6.8lc.
Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, to International Business Machines Corporation. System and method for the continuous movement of a sheet having graphic subject matter thereon through a window of a display screen. ,716,842, Cl. 340-172.500.
Belak, Steven G.; and Hall, Lewis W., Jr., to Standard Oil Company. Sealant composition. 3,716,510, Cl. 260-28.5as.
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Bernold, Jean P. Method and apparatus for building roads. 3,716,302, Cl. 404-70.000.
Berrett, James R.; and Feulner, Roger J., to Honeywell Inc. Temperature control and supervision system for building air conditioning system. 3,716,096, Cl. 165-22.000.
Bertellotti, Ansano; and Thayer, Robert F., to GRE Automatic Electric Laboratories, Incorporated. Printed wiring card shelf. 3,716,760, Cl. 317-10.0dh.
Best Lock Corporation: *See—*

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Beverett, James H. Abbreviated cycle coffeemaker. 3,715,974, Cl. 99-285.000.

Beyerlein, David G., to General Motors Corporation. Variable sensitivity anti-lock brake control. 3,716,273, Cl. 303-21.0cg.

Bhatt, Harshad J.; and Tuttle, James W., to Cogar Corporation. Fabrication method for making an aluminum alloy having a high resistance to electromigration. 3,716,469, Cl. 204-192.000.

Bianchi, Ralph A., to JBF Scientific Corporation. Liquid surface sweeping apparatus. 3,716,142, Cl. 210-242.000.

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Birchler, Robert O.; and Williams, E. R., to Texas Instruments, Incorporated. Process for encapsulating electronic components in plastic. 3,716,764, Cl. 317-234.000.

Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., to Owens-Illinois, Inc. Inspecting articles. 3,716,136, Cl. 209-82.000.

Bixler, Donald; and Corey, Robert H. Trench shoring machine. 3,715,889, Cl. 61-41.00a.

Black and Decker Manufacturing Company, The: *See—*
Brucker, William S., 3,715,875.

Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., to Sun Oil Company. Method for preparing laminated article of metallic, polymeric and wax impregnated cellulosic layers. 3,716,441, Cl. 156-309.000.

Bleckmann, Richard. Tubular heating element. 3,716,693, Cl. 219-553.000.

Bleha, William P., Jr.: *See—*
Scholl, Ronald F.; and Bleha, William P., Jr., 3,716,406.

Blomgren, Oscar C., Jr.: *See—*
Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., 3,716,171.

Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., to Tuxco Corporation. Airless hydraulic system supply. 3,716,171, Cl. 222-396.000.

Blomqvist, Nils Verner: *See—*
Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, 3,716,430.

Blood, Alden E.; and Vinyard, Herschel T., to Eastman Kodak Company. Oxidative dehydrogenation process for preparing unsaturated organic compounds. 3,716,576, Cl. 260-486.00d.

Bloomsburg, Marvin S.; and Nazzer, Don Barkley, to Canadian General Electric Company, Limited. Tower vapour ferd system. 3,716,220, Cl. 261-36.00r.

Blume, Roe C., to Du Pont de Nemours, E. I., and Company. Amide acetal initiated chloral polymerization process. 3,716,522, Cl. 260-64.000.

Bodrova, Aglaida Nikolaevna: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Boehme, Werner R.; Vuht, George; and Dawes Laboratories, Inc. Stabilized trans-diethylstilbesterol compositions. 3,716,645, Cl. 424-346.000.

Boehringer, C. H., Sohn: *See—*
Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, 3,716,587.

Boehringer Mannheim GmbH: *See—*
Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.

Bolger, Thomas V., to RCA Corporation. Color television recorder-reproducer system. 3,716,663, Cl. 178-5.4ac.

Bonanno, Anthony J.: *See—*
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Boomer, John H.: *See—*
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Borel, Joseph; and Robert, Jacques, to Commissariat a l'Energie Atomique. Liquid-crystal display device. 3,716,290, Cl. 350-160.01c.

Borel, Jules & Co.: *See—*
Borel, Mark, 3,715,856.

Borel, Mark, to Borel, Jules & Co. Packaging method. 3,715,856, Cl. 53-41.000.

Borth, Anthony. Tube socket voltage limiting apparatus and method of manufacturing the same. 3,716,819, Cl. 339-143.00t.

Bosch, Robert, G.m.b.H.: *See—*
Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, 3,716,035.
Bosch, Walter; and Schwartz, Reinhard, 3,716,064.
Kobald, Walter, 3,716,308.
Passera, Walter, 3,716,071.
Schmid, Hermann, 3,716,034.

Bosch, Walter; and Schwartz, Reinhard, to Bosch, Robert, G.m.b.H. Fuel injection system with temperature-compensated control valve. 3,716,064, Cl. 137-501.000.

Botkin, Albert L. Tamper-proof closure arrangement. 3,716,162, Cl. 215-42.000.

Bottcher, Rolf, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Sheet conveying device. 3,716,227, Cl. 271-79.000.

Bottcher, Rolf, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Apparatus for connecting an uncadenced apparatus to a following cadenced apparatus for the handling of sheets. 3,716,228, Cl. 271-47.000.

Boutin, Francois Regis. Preparation of aluminum having block texture. 3,716,419, Cl. 148-11.50a.

Bowdish, Donald M.: *See—*
Wolfe, William D., Jr.; and Bowdish, Donald M., 3,716,817.

Bowes, Emmerson, to Mobil Oil Corporation. Alkylation and dealkylation of aromatics in the presence of crystalline aluminosilicates. 3,716,596, Cl. 260-671.00c.

Boyce, Walter A., to Westinghouse Electric Corporation. Method of manufacturing subminiature electric lamps. 3,716,285, Cl. 316-21.000.

Boyd, Gilbert D.: *See—*
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Boyd, Thomas H. Monorail guided electric airplane. 3,715,991, Cl. 104-23.00r.

Boyle, William M., Jr.: *See—*
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Bradam, William R.: *See—*
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Brady, Donnie G., to Phillips Petroleum Company. Olefin halogenation. 3,716,591, Cl. 260-648.00r.

Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., to Phillips Petroleum Company. Poly(esters) of phthalic acid salts and di(haloalkyl) ethers as dye receptive agents. 3,716,601, Cl. 260-873.000.

Brandl, Ernst: *See—*
Knauseder, Franz; and Brandl, Ernst, 3,716,579.

Bratland, Arthur. Preparation of cheese. 3,716,377, Cl. 99-116.000.

Bratland, Arthur. Preparation of foodstuffs containing a high content of emulsified fat. 3,716,378, Cl. 99-122.00r.

Braun, Leon, to Molecular Energy Corporation. Method of making semi-conductive cathodes. 3,716,403, Cl. 117-201.000.

Braunberger, Benjamin A., to Gehl Company. Mower sickle hold-down means. 3,715,845, Cl. 56-305.000.

Breading, Robert P. Floor construction including carpeted trench headers. 3,715,844, Cl. 52-221.000.

Brecker, Lawrence R.; and Kauder, Otto S., to Argus Chemical Corporation. Reaction products of dioctyltin oxide and dioctyltin monohydric aliphatic saturated alcohol thioglycolate esters and process. 3,716,568, Cl. 260-429.700.

Bricker, Carl E., to Goodyear Tire & Rubber Company, The. Constant torque spring applied brake. 3,716,117, Cl. 188-167.000.

Bridgestone Tire Company Limited: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.

Brockhurst, Woodrow W., to Luxaire, Inc. Combustion chamber retaining means. 3,716,044, Cl. 126-151.000.

Brodsky, Marc H., to International Business Machines Corporation. Image recording on tetrahedrally coordinated amorphous films. 3,716,844, Cl. 340-173.01s.

Brodsky, Stuart A.; and Kelly, Raymond A. Vasectomy procedure and instrument for use therewith. 3,716,056, Cl. 128-303.00r.

Broekhuysen, William C., to Sola Basic Industries, Inc. Thermal switch. 3,716,814, Cl. 337-123.000.

Bronder, Joachim C., to Avco Corporation. Non-round fluid dynamometer. 3,715,917, Cl. 73-134.000.

Brooks, Robert E., to TRW Inc. Fourier transform holographic memory with random phase shifting produced by random size variations in a lens array. 3,716,287, Cl. 350-3.500.

Brossard, Cleo A. Decorative article holder. 3,715,823, Cl. 40-152.000.

Brown & Williamson Tobacco Corporation: *See—*
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Litzinger, Elmer Francis, 3,716,500.

Brown, Alan V.; and Hochberg, Frederick, to International Business Machines Corporation. Technique for fabricating integrated incandescent displays. 3,715,785, Cl. 29-25.110.

Brown, Buck C., to Control Concepts Corporation. Time comb generator. 3,716,795, Cl. 328-63.000.

Brown, Donald R.; and Masopust, Otto T., Jr., to Western Electric Company, Incorporated. Methods and apparatus for increasing the capacitance value of a capacitor. 3,715,786, Cl. 29-25.420.

Brown, Earl Franklin; and Kaminski, William, to Bell Telephone Laboratories Incorporated. Sign redundancy reduction in differential pulse modulation systems. 3,716,789, Cl. 325-38.00a.

Brown, John A., to Esso Research and Engineering Company. Nitronium perchlorate stabilized by BF_3. 3,716,624, Cl. 423-274.000.

Brucker, William S., to Black and Decker Manufacturing Company, The. Lawn mower safety guard. 3,715,875, Cl. 56-320.100.

Brunie, Jean-Claude; and Crenne, Noel, to Rhone-Poulenc S.A. Preparation of epoxide compounds by epoxidizing olefins with preformed organoperoxyboron compounds. 3,716,563, Cl. 260-348.0sl.

Brunner, Julius, to Siemens Aktiengesellschaft. Brushless D.C. motor having permanent magnet rotor and Hall effect commutation including speed control responsive to winding voltage. 3,716,769, Cl. 318-254.000.

Bruns, Eilert F.: *See—*
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Brush Beryllium Company, The: *See—*
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Bruson, Herman A.; and Gould, Henry, to Milchem Incorporated. 3,716,487, Cl. 252-82.000.

Bryant, Richard W.; and Tu, George K., to Cogar Corporation. Temperature compensation for logic circuits. 3,716,722, Cl. 307-215.000.

Bryant, William G., to Park-Ohio Industries, Inc. Apparatus for setting the air gap between an inductor and a valve seat. 3,716,690, Cl. 219-10.770.

Buckman, Wayne T.: *See—*
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Buice, Hubert H. Shoe polish dispensing device. 3,716,168, Cl. 222-146.0he.

Bunker Ramo Corporation: *See—*
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Bunker-Ramo Corporation, The: *See—*
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Burgess, James V., Jr. Mine ventilation control system. 3,715,969, Cl. 98-50.000.

Burke, Oliver W., Jr. Silica pigments and elastomer-silica pigment masterbatches and production processes relating thereto. 3,716,513, Cl. 260-33.6a0.

Burkhart, John H.; and Slick, Edward C., to GTE Sylvania Incorporated. Compositions for improved solderability of copper. 3,716,421, Cl. 148-6.14r.

Burnett, Arthur Peter, to Ney, J. M., Company, The. Rhenium containing gold alloys. 3,716,356, Cl. 75-165.000.

Butler, Frank W. Centerboard pivot for a sailboat. 3,716,011, Cl. 114-132.000.

Butler, James N.; and Cogley, David R., to United States of America, Air Force. Lithium battery electrolyte additive and method of improving discharge rate. 3,716,410, Cl. 136-6.000.

Butz, Josef. Foldable stand. 3,716,211, Cl. 248-168.000.

Byrne, Desmond J.: *See—*
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Cabot Corporation: *See—*
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Cade, James E.; and Mossuto, Frank, said Cade assor. to said Mossuto, Frank. Angularly adjustable end wrench. 3,715,937, Cl. 81-177.800.

Cain, Troy D.: *See—*
Frydenberg, Donald V.; and Cain, Troy D., 3,716,179.

Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, to United States of America, Atomic Energy Commission. Cathodes for secondary electrochemical power-producing cells. 3,716,409, Cl. 136-6.000.

Calcagni-Frazier-Zajachowski, Architects, Inc.: *See—*
Frazier, Richard B., 3,716,270.

Calcagno, Benedetto; and Ghirga, Marcello, to Societa Italiana Resine S.p.A. Process for preparing olefin esters. 3,716,581, Cl. 260-497.00a.

Caldwell, Melvin R.: *See—*
Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., 3,716,047.

Calvert, Rodney K., to Mead Corporation, The. Mechanism for lining shells. 3,716,321, Cl. 425-383.000.

Campbell, David H.: *See—*
Cook, Charles A.; and Campbell, David H., 3,716,434.

Campbell, Erwin A.: *See—*
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Campbell, Robert D., to San Fernando Electric Manufacturing Co. Apparatus for automatically testing and sorting electrical elements. 3,716,134, Cl. 209-73.000.

Canadian General Electric Company, Limited: *See—*
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Canadian National Railway Company: *See—*
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Canadian Patents and Development Limited: *See—*
Fam, Wagih Zaki, 3,716,734.

Candy, James Charles, to Bell Telephone Laboratories, Inc. Stabilized delta modulator. 3,716,803, Cl. 332-11.00d.

Cano, Fernando. Device for enhancing gas discharge. 3,715,970, Cl. 98-70.000.

Canon Kabushiki Kaisha: *See—*
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Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,716,294.

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Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, to Process for preparing the P,P-dinitrobibenzyl. . 3,716,590, Cl. 260-645.000.

Carborundum Company, The: *See—*
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Cardiac Resuscitator Corporation: *See—*
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Carding Specialists (Canada) Limited: *See—*
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Carmet Company: *See—*
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Carpenter, Henry G.: *See—*
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Carrier Engineering Company Limited: *See—*
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Carter, Cecil O.: *See—*
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Carter, William A.; Sievert, William C.; and Munson, James L., to Inland Steel Company. Roller coating system for one side strip coating. 3,716,019, Cl. 118-246.000.

Carver-Greenfield Corporation: *See—*
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Case, Cecil L.; and Garrison, Harold Keith, to Hesston Corporation. Variable speed power transmission. 3,715,928, Cl. 74-218.000.

Casparian, Robert E.: *See—*
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Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
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Catalytic Technology Corporation: *See—*
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Caterpillar Tractor Company: *See—*
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Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper an copper alloys and products thereof. 3,716,427, Cl. 156-3.000.

Caulfield, Henry John; and Perkins, Dean Roger, to Sperry Rand Corporation. Fingerprint identification apparatus. 3,716,301, Cl. 356-165.000.

Celanese Coatings Company: *See—*
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Celanese Corporation: *See—*
Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., 3,716,575.

Cenci, Harry J., to Rohm and Haas Company. t-Butyl alcohol/water cosolvent emulsion copolymerization of a monomeric system comprising methyl methacrylate and bicyclic methacrylate. 3,716,524, Cl. 260-78.500.

Central Glass Company, Ltd.: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Centre Electronique de France: *See—*
Lambert, Francois; and Bartosiak, Andrzej, 3,716,656.

Cerny, Frank J., Jr., to Motorola, Inc. Intermodulation rejection capabilities of field-effect transistor radio frequency amplifiers and mixers. 3,716,730, Cl. 307-295.000.

Ceskoslovenska akademie ved: *See—*
Musilek, Vladimir, 3,716,635.

Chaffin, John H., III, to Honeywell Inc. Optical memory with interferometer tracking. 3,716,845, Cl. 340-173.01m.

Chaft, Marc E. Intrauterine contraceptive device. 3,716,052, Cl. 128-130.000.

Chaikin, Malcolm; Rokfalussy, Desmond; and Dircks, Alexander Douglas. Apparatus for the processing of wool fibres. 3,715,780, Cl. 19-178.000.

Chaintron, Gerard, to Rhone-Poulenc S.A. Process for the purification of lactic acid. 3,716,584, Cl. 260-535.00r.

Chamberlain Manufacturing Corporation: *See—*
Willmott, Colin B., 3,716,865.

Chambers, James L. Adjustable mounting device. 3,715,850, Cl. 52-701.000.

Chandrasekaran, Santosh K.; and King, Cary Judson III, to United States of America, Agriculture. Slush-drying of liquid foods. 3,716,382, Cl. 99-205.000.

Chapman, Charles C., to Phillips Petroleum Company. Apparatus for increasing quality and quantity of product from an existing chemical apparatus operation. 3,716,343, Cl. 23-285.000.

Chapman, Richard D., to Monsanto Company. Method for producing high tenacity-66 filaments. 3,716,611, Cl. 264-290.00n.

Charlot, Lincoln H., Jr., to Minnesota Mining & Manufacturing Company. Radar detector. 3,716,854, Cl. 343-5.0pd.

Chase, Vernon Lindsay: *See—*
Kolsky, Rodger E.; and Chase, Vernon Lindsay, 3,716,488.

Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., to Chatlos Systems, Inc. Dry air system. 3,715,866, Cl. 55-179.000.

Chatlos Systems, Inc.: *See—*

Chatlos, Edward S.; Schroeder, Paul G. K.; and Prinkey, Clarence O., 3,715,866.

Chaves, Manuel J., to Parking Company of America. Parking lot coin receptacle. 3,716,183, Cl. 232-1.00r.

Cherry-Burrell Corporation: *See—*
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Chesapeake and Ohio Railway Company, The: *See—*
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Chevron Research Company: *See—*
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Jacobson, Robert L.; and Vanselow, Robert D., 3,716,477.
Magee, Philip S., 3,716,600.

Chiappe, Wayne T., to Continental Can Company, Inc. Method for electrodeposition of cans. 3,716,468, Cl. 204-181.000.

Chiba, Yoshikazu: *See—*
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Chicago Musical Instrument Co.: *See—*
Freeman, Alfred B., 3,716,725.

Chilcoat, Kermit E., to Eaton Corporation. Furnace humidifier. 3,716,043, Cl. 126-113.000.

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Chisholm, Douglas S.: *See—*
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Chivinsky, Joseph A.: *See—*
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Masten, Michael K.; and Choate, William C., 3,716,840.

Chorvat, Robert J.; and Pappo, Raphael, to Searle, G. D., & Co. 4-Methylen-2-oxa-3-keto androstanes and 4-methyl-delta 4 derivatives thereof. 3,716,559, Cl. 260-343.20s.

Chramiec, Mark A.: *See—*
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Chrysler Corporation: *See—*
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Chu, Vincent H. K., to Bethlehem Steel Corporation. High porosity manganese oxide pellets. 3,715,764, Cl. 423-49.000.

Chuan, Raymond L., to Susquehanna Corporation, The. Apparatus for sensing air-borne particulate matter. 3,715,911, Cl. 73-28.000.

Ciba-Geigy: *See—*
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Ciba-Geigy AG: *See—*
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Anner, Georg; and Kalvoda, Jaroslav, 3,716,638.
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Komninos, John; Klemchuk, Peter; and Ham, George, 3,716,329.
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Cielaszyk, Edward F., to General Time Corporation. intermittently repeating alarm mechanism. 3,715,879, Cl. 58-18.000.

Civardi, Frank Peter; and Kuenstler, Hans-George. Treating microporous material. 3,716,397, Cl. 117-77.000.

Clark Equipment Company: *See—*
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Clark, Eugene F.; deceased (by Clark, Ursa W.; heir), to Fieldcrest Mills, Inc. Woven pile fabrics. 3,716,078, Cl. 139-399.000.

Clark, George B., to Aqua-Chem, Inc. Reverse osmosis separation apparatus. 3,716,143, Cl. 210-321.000.

Clark, Reginald Thomas, to Alfa-Laval AB. Method and apparatus for making cheese. 3,716,376, Cl. 99-115.000.

Clark, Ursa W.: *See—*
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Clarke and Smith Manufacturing Company: *See—*
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Clary Corporation: *See—*
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Classen, Gunter, to Mannesmann-Meer Aktiengesellschaft. Injection molding machine. 3,716,323, Cl. 425-450.000.

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Clostermann, Friedrich; and Richter, Hans-Joachim, to Trilux-Lenze KG. Lamp comprising an elongated light source, particularly a rod-shaped fluorescent lamp, and shade of transparent material. 3,716,710, Cl. 240-106.00r.

Coal Industry (Patent) Limited: *See—*
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Coates, Clarence A., Jr.: *See—*
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Coates, Harry D. Educational game. 3,715,810, Cl. 35-35.00r.

Cofer, Daniel B., to Southwire Company. Hot-formed copper-base product. 3,716,423, Cl. 148-32.000.

Cogar Corporation: *See—*
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Bryant, Richard W.; and Tu, George K., 3,716,722.
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Cogley, David R.: *See—*
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Cohen, David J. Encoded data card system. 3,716,701, Cl. 235-61.11h.

Cohen, Elliott: *See—*
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Cohen, Richard Lewis, to Bell Telephone Laboratories, Incorporated. Thickness measurements using the Mossbauer effect. 3,716,715, Cl. 250-83.30d.

Colby, Kenneth G.; and Riggs, Robert F., to Sperry Rand Corporation. Display system to generate symbols formed of conic sections. 3,716,749, Cl. 315-23.000.

Colchester, John Edward, to Imperial Chemical Industries Limited. Production of bipyridylium salts and related compounds. 3,716,546, Cl. 260-295.0am.

Cole, Edward L.: *See—*
Hess, Howard V.; and Cole, Edward L., 3,716,474.

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Coleswood Products, Inc.: *See—*
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Colgate-Palmolive Company: *See—*
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Collins Radio Company: *See—*
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Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,716,476.

Comco Incorporated: *See—*
McGowen, Harold E., Jr.; and Tausch, Gilbert H., 3,716,101.

Comfort, Kent B., to Mar-Com Development, Ind. Hexadecimal slide rule. 3,716,186, Cl. 235-70.00r.

Commissariat a l'Energie Atomique: *See—*
Borel, Joseph; and Robert, Jacques, 3,716,290.
Lions, Noel, 3,716,450.

Community Bank, The: *See—*
Jones, Allen Jacob, 3,716,004.

Compagnie Generale d'Electricite: *See—*
Mouroux, Claude; Peres, Gerard; and Valette, Pierre, 3,716,428.

Compagnie Internationale pour l'Informatique: *See—*
Valin, Jean, 3,716,847.

Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, to Bell Telephone Laboratories, Incorporated. Apparatus for detecting the moving areas in a video signal. 3,716,667, Cl. 178-6.000.

Constable, Ronald Jack Walker, to Hirst Microwave Industries, Limited. Method and apparatus for cooking. 3,716,687, Cl. 219-10.550.

Constructors John Brown Limited: *See—*
Salter, David Stanley; and Smith, David Henry, 3,716,459.

Continental Can Company, Inc.: *See—*
Chiappe, Wayne T., 3,716,468.
Tryzna, Joseph J.; and Becker, George L., 3,716,400.

Continental Oil Company: *See—*
Davis, J. Gilbert, II, 3,716,272.

Control Concepts Corporation: *See—*
Brown, Buck C., 3,716,795.

Control Graphics Company: *See—*
Hansen, Lindsey B., Jr.; and Hyer, Val D., 3,715,822.

Cook, Charles A.; and Campbell, David H., to Ethyl Corporation. Seal for plastic sheeting. 3,716,434, Cl. 156-157.000.

Cook, William H., to BASF Wyandotte Corporation. Low concentration stannous carboxylate catalysis of polyesterification. 3,716,523, Cl. 260-75.00m.

Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., to Texaco Inc. Effluent cooling in a hydrocracking and hydrodesulfurizing process. 3,716,476, Cl. 208-97.000.

Copley Press, Inc.: *See—*
Shimmin, Lawrence E., 3,716,178.

Corbett, Robert Lee, Jr. Load support diffuser and method of manufacture. 3,716,223, Cl. 432-260.000.

Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., to Monsanto Company. Process for the preparation of a poly(vinyl acetate-dialkyl maleaee-acrylic acid) textile sizes. 3,716,547, Cl. 260-29.6ta.

Corey, Robert H.: *See—*
Bixler, Donald; and Corey, Robert H., 3,715,889.

Corning Glass Works: *See—*
Weetall, Howard H., 3,716,456.

Corte, Herbert; and Meyer, Alfred, to Bayer Aktiengesellschaft. Anion exchanger with sponge structure and process of using same. 3,716,482, Cl. 210-37.000.

Couland, Roger. Apparatus for tapering flexible tubes. 3,715,901, Cl. 72-58.000.

Courtney, Donald L., to ICI America Inc. Liquid shaving composition and method of shaving. 3,715,942, Cl. 83-22.000.

Courty, Philippe, to Institut Francais du Petrole des Carburants et Lubrifiants. Manufacture of catalysts of the iron molybdate type for use particularly in the catalytic oxidation of alcohols to aldehydes. 3,716,497, Cl. 252-470.000.

Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., to Wascon Systems, Inc. Waste disposal apparatus. 3,716,197, Cl. 241-43.000.

Crawford, David D.; and Elvington, John W. Preformed manhole body. 3,715,958, Cl. 52-21.000.

Creagh, Linda T.; Jones, Derick; and Lu, Sun, to Texas Instruments, Incorporated. Electro-optical display devices using smectic-nematic nematic liquid crystal mixtures. 3,716,289, Cl. 350-160.01c.

Crenne, Noel: *See—*
Brunie, Jean-Claude; and Crenne, Noel, 3,716,563.

Crippen, Huston D., to Coleswood Products, Inc. Automatic feeder device. 3,716,172, Cl. 222-453.000.

Criswell, Dick M. Pressure equalizing valve. 3,716,072, Cl. 137-510.000.

Croon, Ingemar Liss-Albin; and Blomqvist, Nils Verner, to Mo Och Domsjo Aktiebolag. Tampon and process and apparatus for making the same. 3,716,430, Cl. 156-62.400.

Cross, John V.: *See—*
Walmsley, Martin F.; and Cross, John V., 3,716,365.

Crowell, Merton Howard; and Gordon, Eugene Irving, to Bell Telephone Laboratories, Incorporated. Diode-array photocathode with photoemitter activation. 3,716,740, Cl. 315-11.000.

Csicsery, Sigmund M.; and Kittrell, James R., to Chevron Research Company. Hydrotreating catalyst comprising an interstratified crystalline clay-type aluminosilicate component and a crystalline zeolitic molecular sieve component and process using said catlyst. 3,716,475, Cl. 208-59.000.

Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, to University of Melbourne. Electrode of petroleum coke and brown coal char. 3,716,471, Cl. 204-294.000.

Currier, John W.; Gadbois, Richard T.; and Wilde, Arthur G., to Minnesota Mining and Manufacturing Company. Aircraft cleaning. 3,716,066, Cl. 134-73.000.

Cutler-Hammer, Inc.: *See—*
Leavitt, Minard A., 3,716,177.
Robinson, Douglas Burton, 3,715,933.

Dabrowski, Casimer J., to Seeburg Corporation of Delaware, The. Vending machine pricing control arrangement. 3,716,124, Cl. 194-1.00n.

Daco Safety Products, Inc.: *See—*
Mangels, Ralph W., 3,716,170.

Dadario, Michael G.: *See—*
Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.

Dahm, Franz-Ludwig: *See—*
Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.

Daikin Kogyo Company Limited: *See—*
Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3,716,643.

Dailing, James L.: *See—*
Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., 3,716,808.

Daimler-Benz Aktiengesellschaft: *See—*
Lamm, Heinz, 3,716,313.

Dangschat, Rainer, to Siemens Aktiengesellschaft. High voltage resistant electrical component, in particular for color television receivers. 3,716,776, Cl. 321-8.00r.

Daniels, Dennis: *See—*
Weisbeck, Ralph L.; and Daniels, Dennis, 3,715,947.

Danno, Mituaki: *See—*
Kishimoto, Hiroshi; Kobayashi, Kenzo; Hamazaki, Yoshiharu; and Danno, Mituaki, 3,715,919.

Darsow, Gerhard; and Schnell, Hermann, to Bayer Aktiengesellschaft. Pyridine-bis-(hydroxyaryl ethers) and thereof. 3,716,549, Cl. 260-297.00r.

Davidsohn, Uryon S., to Motorola, Inc. Method of making semiconductor devices through overlapping diffusions. 3,716,425, Cl. 148-175.000.

Davidson, Richard L., to Grav-I-Flo Corporation, The. Apparatus and method for finishing workpieces. 3,715,840, Cl. 51-163.000.

Davis, J. Gilbert, II, to Continental Oil Company. Method of creating large diameter cylindrical cavities by solution mining. 3,716,272, Cl. 299-5.000.

Davis, Lessel George, to Twentieth Century Blinds Pty., Limited. Machine for cutting rod-like articles into required lengths. 3,715,940, Cl. 82-63.000.

Davis, Marshall Edwin: *See—*
Baskerville, Henry; and Davis, Marshall Edwin, 3,716,028.

Davis, Martin A.: *See—*
Dobson, Thomas A.; and Davis, Martin A., 3,716,541.

Davis, Paul, to Sweetheart Plastics, Inc. Capping device for containers. 3,715,865, Cl. 53-319.000.

Dawes Laboratories, Inc.: *See—*
Boehme, Werner R.; Vuht, George; and Dawes Laboratories, Inc., 3,716,645.

De Biasi, Charles P. Apparatus for pollution control of furnace gase. 3,715,868, Cl. 55-315.000.

De Jong, Hendrik Johannes: *See—*
Greve, Reinhard Cornelis; and De Jong, Hendrik Johannes, 3,716,812.

De Long, Vincent R.: *See—*
Teggatz, Eugene D.; De Long, Vincent R.; and Holtzer, Dale A., 3,716,794.

de Mecquenem, Robert. Clamp with resilient gripping unit for use with overhead conductor spacers and a spacer including the same. 3,716,650, Cl. 174-42.000.

De Ruiter, Ernest H.: *See—*
Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., 3,716,542.

De Wit, Willem; and Hendricks, Petrus F.A.M., to Stamicarbon N.V. Apparatus for coating granules with a thin dense layer. 3,716,020, Cl. 118-303.000.

Deakin, Stanley Thomas, to Sealectro Limited. Electrical jack plugs. 3,716,820, Cl. 339-147.00p.

Dean, William Bruce, to Johnson & Johnson. Privacy cubicle curtain cloth. 3,716,446, Cl. 161-91.000.

Deck, Harold R.: *See—*
Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.

Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., to American Optical Corporation. Method for producing laser glasses having high resistance to internal damage and the product produced thereby. 3,716,349, Cl. 65-32.000.

Deere & Company: *See—*
Fox, Robert Eugene, 3,716,212.

Deering, Charles S., to E-Systems, Inc., mesne. Sequential check-out system including code comparison for circuit operation evaluation. 3,716,783, Cl. 324-73.000.

Dehm, Henry C., to Hercules Incorporated. Method for bonding solid propellants to rocket motor casing. 3,716,604, Cl. 264-3.00r.

Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V. Apparatus for the application of a refractory combination therewith. 3,716,316, Cl. 425-13.000.

Delamater, Philip G.: *See—*
Lincoln, Patrick A.; and Delamater, Philip G., 3,716,484.

Delapp, Darwin Fiske, to American Cyanamid Company. Supersaturated solid solutions of photochromic materials in epoxides. 3,716,489, Cl. 252-300.000.

Delembre, Andre Emile; and Jarrige, Georges Roger; deceased (by Jarrige, Jeannine Germaine; administrator), said Delembre and said Nguyen assors. to ITT Industries, Inc. Hermetic end seals for envelope of a metal vapor lamp. 3,716,744, Cl. 313-220.000.

Deltrol Corporation: *See—*
Harris, John L., 3,716,720.

Demco Incorporated: *See—*
Finley, Bruce M.; and Sturdivan, Paul G., 3,716,480.

Demme, John P.: *See—*
Rehberger, Louis W.; Williams, John C.; and Demme, John P., 3,716,303.

Dengo, Tadao: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.

Denki Onkyo Co., Ltd.: *See—*
Sohoma, Takeyoshi, 3,716,748.

Denki Onkyo Company, Ltd.: *See—*
Sato, Hideo, 3,716,778.

DePaolis, Potito U. Process for manufacture of soy concentrates, so isolates and related products. 3,716,372, Cl. 99-17.000.

Depew, George N., to United States of America, Army. Liquid bearing. 3,716,278, Cl. 308-9.000.

Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, to Institut Francais Du Petrole, des Carburants et Lubrifiants. Process for removing traces of hydrogen sulfide and mercaptans from gases. 3,716,620, Cl. 423-228.000.

Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., to Sanders Nuclear Corporation. Means and method for obtaining high temperature process fluids from low temperature energy sources. 3,716,099, Cl. 165-135.000.

Deshayes, Philippe Marie: *See—*
Weber, Guy Paul; and Deshayes, Philippe Marie, 3,716,754.

Design Elements, Inc.: *See—*
Fretwell, Richard D., 3,716,672.

Desjardin, William P.: *See—*
Downing, Gertrude E.; and Desjardin, William P., 3,715,772.

Detroyer, Georges D., to Wolverine-Pentronix, Inc. Fluid power eject mechanism for a powder compacting press and method of compacting. 3,715,796, Cl. 29-420.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.

Devlin, Edward J., to Glacier Ware, Inc. Drinking cup for freezing a beverage to a slush-like condition. 3,715,895, Cl. 62-457.000.

DeZurik Corporation: *See—*
Ostroot, Gerald F.; and Torbarg, Robert H., 3,715,798.

Di Rocco, James V., to Gordon Engineering Company. Sample and hold circuit. 3,716,800, Cl. 328-151.000.

Diamond International Corporation: *See—*
Loeffler, Thomas V., 3,716,127.

Diamond Shamrock Corporation: *See—*
Greene, Udell T., 3,716,346.

DIEHL: *See—*

Trimpler, Walter, 3,715,883.

Diekman, John D.: *See—*
Spain, Virginia L.; and Diekman, John D., 3,716,564.

Dippold, William L., to Stackpole Carbon Company. Electrical brush assembly. 3,716,735, Cl. 310-240.000.

Dircks, Alexander Douglas: *See—*
Chaikin, Malcolm; Rokfalussy, Desmond; and Dircks, Alexander Douglas, 3,715,780.

Dirk van der Lee, Jan Gijsbert: *See—*
Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.

Disco Engineering, Inc.: *See—*
Henson, Artel R., 3,715,968.

Display Corporation International: *See—*
Moore, Oliver K., 3,716,256.

Dixon, Kenneth P., to Systems Engineering Associates, Inc. Electrical control system. 3,716,704, Cl. 235-92.0pd.

Dobson, Thomas A.; and Davis, Martin A., to Ayerst, McKenna and Harrison Limited. Substituted derivatives of 10,11-dihydro-5, 10-(iminomethano)-5h-dibenzo cycloheptenes and preparation thereof. 3,716,541, Cl. 260-286.00r.

Dodd, Homer C. Power driven lifting and positioning device. 3,716,151, Cl. 214-77.00r.

Dokoshi, Noriaki: *See—*
Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.

Dombro, Robert A. Flame retardent compositions of matter. 3,716,516, Cl. 260-45.80a.

Domokos, Jozsef; Benedek, Gyorgy; Kiss, Bela; Winkler, Laszlo; and Beller, Zoltan. Method and apparatus for coating metal workpieces with water soluble or colloidal coloring matter emulsified in water. 3,716,473, Cl. 204-299.000.

Donald, Alexander: *See—*
Bemiss, Robert P.; and Donald, Alexander, 3,716,180.

Donermeyer, Donald D.: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,716,547.

Dong, Le Hao: *See—*
Francois, Raymond; Sarbach, Jacques; Dong, Le Hao; Mizoule, Jacques; and Ricci, Charles, 3,716,642.

Dornier A.G.: *See—*
Hentschel, Wolfgang, 3,715,820.

Dorr, John A.; and Gruen, Henry M., to Westinghouse Electric Corporation. Side looking sonar apparatus. 3,716,824, Cl. 340-3.00r.

D'Ottavio, Eugene D.: *See—*
Grunwald, John J.; and D'Ottavio, Eugene D., 3,716,392.

Dotto, Gianni A. Automotive apparatus. 3,716,098, Cl. 165-88.000.

Douglas & Lomason Company: *See—*
Green, John F., 3,716,082.

Dow Chemical Company, Limited: *See—*
Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., 3,716,612.

Dow Chemical Company, The: *See—*
Aung, Tin; and Boyle, William M., Jr., 3,716,447.
Glomski, Ronald L.; and Greminger, George K., Jr., 3,716,507.
Landreville, Gerald, 3,716,081.
Rakshys, Joseph W., Jr., 3,716,501.
Tomalia, Donald A., 3,716,520.

Downing, Gertrude E.; and Desjardin, William P. Reciprocating corner and baseboard cleaning auxiliary attachment for rotary floor treatment machines. 3,715,772, Cl. 15-49.0rb.

Drescher, Kurt: *See—*
Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, 3,716,296.

Dress, William: *See—*
Grimes, John Herbert; and Dress, William, 3,716,605.

Dresser Industries, Inc.: *See—*
Sharki, Martin J.; and Griffin, Phil H., 3,716,707.

Dron, Ninel Alexeevna: *See—*
Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.

Drumm, Arthur E. Rotary sweeper brush. 3,715,773, Cl. 15-183.000.

Dryden, Paul C.: *See—*
Weisstuch, Aaron; Schell, Charles E., III; and Dryden, Paul C., 3,716,460.

Du Pont de Nemours, E. I., and Company: *See—*
Axelrod, Robert Jay, 3,716,401.
Blume, Roe C., 3,716,522.
Haskell, Vernon Charles, 3,716,511.
Lyon, John B., 3,716,320.
Sieja, James Bernard, 3,716,534.
Simms, John A.; and Walus, Aloysius N., 3,716,506.
Vasta, Joseph A., 3,716,599.

Dubbe, Richard F., to Minnesota Mining and Manufacturing Company. Separation color recorder system with recording on motion picture film using less than a full field of information to record each frame of film. 3,716,664, Cl. 178-5.4cd.

Ducommun Incorporated: *See—*
Leeds, Donald H., 3,716,332.

Dukats, Ilmars Z.: *See—*
Graham, Bruce C.; and Dukats, Ilmars Z., 3,716,492.

Duling, Irl N.: *See—*
Black, Ernest P.; Duling, Irl N.; Merges, John C., Jr.; and Talbot, Alfred F., 3,716,441.

Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., to United States of America, Navy, mesne. Torque clutch for military fuzes. 3,715,986, Cl. 102-71.000.

Dupree, Paul Montgomery: *See—*
Tredinnick, Bruce Charles; Gambale, James Richard; and Dupree, Paul Montgomery, 3,715,842.

Dupuy, Harold P.: *See—*
Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., 3,715,910.

Dura Corporation: *See—*
Littmann, Joseph C., 3,715,931.

Durant, Will G.; and Ball, David C., to Cherry-Burrell Corporation. Valve bag placer. 3,715,858, Cl. 53-190.000.

Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, to Ahmedabad Manufacturing and Calico Printing Co., Ltd. Process for printing of fabrics consisting of synthetic fibers. 3,716,326, Cl. 8-62.000.

Dynamit Nobel AG: *See—*
Termin, Erich; and Hauck, Gerhard, 3,716,567.

E-Systems, Inc., mesne: *See—*
Deering, Charles S., 3,716,783.

Eastman Kodak Company: *See—*
Blood, Alden E.; and Vinyard, Herschel T., 3,716,576.
Harvey, Donald M., 3,715,959.
Simon, Horst; and Kollgus, Heinrich, 3,715,960.
Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., 3,716,327.

Eaton Corporation: *See—*
Chilcoat, Kermit E., 3,716,043.

Eaton Yale & Towne, Inc.: *See—*
Pipes, George R., 3,716,147.

Eber, Nicolas, to Aktiebolaget Electrolux. Absorption refrigeration apparatus of the inert gas type. 3,715,896, Cl. 62-490.000.

Ebey, Edward W., to International Harvester Company. Weld fixture and axle shaft installation guide. 3,715,935, Cl. 74-607.000.

Echterhoff, Heinrich; and Herz, Wilfried, to Bergwerksverband G.m.b.H., Firma. Device for charging coking ovens. 3,716,150, Cl. 214-35.00r.

Eckert, Alton B., Jr.; and Jones, Howell A., Jr., to Pitney-Bowes, Inc. Method and apparatus for optical code reading. 3,716,699, Cl. 235-61.11e.

Eckert, Konrad: *See—*
Adler, Karl-Heinz; Knapp, Heinrich; and Eckert, Konrad, 3,716,035.

Economics Laboratory, Inc.: *See—*
Miller, Carl A., 3,716,194.

Economos, James N.: *See—*
Nickerson, Robert J.; and Economos, James N., 3,715,833.

Economy, Constatine F.: *See—*
Parks, Kenneth J.; and Economy, Constatine F., 3,715,783.

Economy, James; Frechette, Francis J.; and Wohrer, Luis C., to Carborundum Company, The. Etherified or esterified phenolic resin fibers and production thereof. 3,716,521, Cl. 260-59.000.

Edge, Dick O.; Hammond, Raymond F.; and Sutton, Robert S., to Ex-Cell-O Corporation. Structure for and method of tool selection. 3,716,128, Cl. 198-38.000.

Edwards, John A.: *See—*
Ackrell, Jack; Edwards, John A.; and Fried, John H., 3,716,529.

Efimov, Alexei Vasilievich: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Ginur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Egami, Seiji: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Egawa, Takeshi: *See—*
Tenkumo, Shohei; and Egawa, Takeshi, 3,715,964.

Eguchi, Masaomi: *See—*
Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, 3,716,519.

Egusa, Taku: *See—*
Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, 3,715,852.

Ehlert, Harry C. Bow-mounted arrow quiver. 3,716,174, Cl. 224-1.00b.

Eisai Kabushiki Kaisha: *See—*
Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, 3,716,454.

Eisner, Steve, to Norton Company. Rechargeable electrochemical power supply. 3,716,413, Cl. 136-86.00a.

Electric Power Storage Limited: *See—*
Peters, Kenneth, 3,716,412.

Electrospace Corporation: *See—*
Meri, Kalju, 3,716,673.

Ellanin Investments Ltd.: *See—*
Lowry, John D., 3,716,670.

Elliott Brothers (London) Limited: *See—*
Whitehead, Eric A. N.; Carpenter, Henry G.; and Chinn, Peter D., 3,716,784.

Elsner, Edwin C., 29% to Fink, Max,, 10% to Hahn, Floyd C. and 10% to Littlebury, Hugh W., Sr. Device for releasably gripping an elongate flexible member. 3,716,115, Cl. 188-65.100.

Elvington, John W.: *See—*
Crawford, David D.; and Elvington, John W., 3,715,958.
Email Limited: *See—*
Baker, Colin J.; Preen, Raymond C.; and Wilson, Donald W., 3,716,122.
Emanuelson, Roger C.: *See—*
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.
Emhart Corporation: *See—*
Gerlach, John R., 3,716,261.
Emoto, Saburo: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.
Engelhard Minerals & Chemicals Corporation: *See—*
Adlhart, Otto J.; and Terry, Peter L., 3,716,416.
Engelhardt, Friedrich; Heid, Christian; Gunzert, Willi; Krusche, Erwin; and Meyer, Artur, to Cassella Farbwerke Mainkur Aktiengesellschaft. Water-soluble sulfur dyestuffs. 3,716,525, Cl. 260-128.000.
Enterprise de Recherches et d'Activites Petrolieres: *See—*
Liautaud, Jean, 3,716,107.
Environment/One Corporation: *See—*
Rich, Theodore A., 3,715,809.
Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, to Fortuna-Werke Maschinenfabrik Aktiengesellschaft. Offset printing machine. 3,715,979, Cl. 101-144.000.
Ericson, Gene S., to Westinghouse Electric Corporation. Stator winding machine. 3,716,199, Cl. 242-1.10r.
Erik, Carl L.; and Scott, William J., to GTE Sylvania Incorporated. Valving means for injection molding apparatus. 3,716,318, Cl. 425-245.000.
Erlichman, Irving, to Polaroid Corporation. Reflex member positioning mechanism. 3,715,961, Cl. 95-42.000.
Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Mercapto-methyl sulphides. 3,716,588, Cl. 260-609.00r.
Essex International, Inc.: *See—*
Prouty, Robert E.; and Graf, Robert D., 3,716,811.
Reed, Lawrence N., 3,715,934.
Esso Research and Engineering Company: *See—*
Brown, John A., 3,716,624.
Esty, Joseph J. Method of preserving perishable products. 3,715,860, Cl. 53-22.00b.
Ethyl Corporation: *See—*
Cook, Charles A.; and Campbell, David H., 3,716,434.
Meltsner, Bernard R., 3,716,603.
Evangelisti, Carlo John: *See—*
Belady, Laszlo Antal; Evangelisti, Carlo John; and Roth, Rogert Ingersoll, 3,716,842.
Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, to Gordon, Sherritt, Mines Limited. Preparation of thoriated nickel-chromium alloy powder. 3,716,357, Cl. 75-.5bc.
Evans, Harry T., to Pyco, Inc. Profile thermocouple. 3,716,417, Cl. 136-232.000.
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Fader, Marshall Lloyd; and Christner, James Edward, to Miles Laboratories, Inc. Test composition and method for the in vitro determination of thyroid function. 3,716,632, Cl. 424-1.000.
Fagan, Castle H.; and Lynn, Robert R., to Textron Inc. Energy absorbing landing gear. 3,716,208, Cl. 244-108.000.
Fam, Wagih Zaki, to Canadian Patents and Development Limited. Parametric motor. 3,716,734, Cl. 310-72.000.
Fannon, Robert D., Jr., to Harsco Corporation. Automatic window washer. 3,715,774, Cl. 15-302.000.
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Fennell, Joseph W. Subsoil aerator for depositing and detonating explosive pellets. 3,716,005, Cl. 111-1.000.
Fennema, Everett. Berry basket and cover. 3,716,164, Cl. 220-60.00r.
Ferranti Limited: *See—*
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Muhlbach, Anton; and Fichtner, Rudi, 3,715,767.
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Finamore, Paul V., to World of Wigs Mfg. Co., Inc. Hairpiece. 3,716,065, Cl. 132-53.500.
Finch, Ray N.; Mireur, John P.; and Fouts, Hollye R., to Celanese Corporation. Purification of bis (2-hydroxyethyl) terephthalate. 3,716,575, Cl. 260-475.0pr.
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Finkelstein, Laurence Stephen. Electrical harness with moulded sockets. 3,716,818, Cl. 339-97.001.
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Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, to Fischbein, Dave, Company. Automatic stitch-cutting mechanism for bag-closing sewing machines. 3,716,007, Cl. 112-11.000.
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Fischer, Artur. Expandible connector for fractured bones. 3,716,051, Cl. 128-92.0bb.
Fisher, Donald E.; and Pleshko, Peter, to International Business Machines Corporation. Synchronous detector for monopulse key sampling electronic keyboard. 3,716,850, Cl. 340-365.00e.
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Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, to Ciba-Geigy AG. Photographic, light-sensitive material containing a trisazo dyestuff. 3,716,368, Cl. 96-99.000.
Fronczak, Daniel H., 50% to Abel's Bagels, Inc. Bagel bagging machine. 3,715,857, Cl. 53-62.000.
Fry, Ralph, to Ferro Corporation. Applicator mechanism for particulate material. 3,716,021, Cl. 118-308.000.
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Frykhult, Rune Helmer, to Aktiebolaget Celleco. Cyclone separator. 3,716,137, Cl. 209-211.000.
Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Method and apparatus for operating on a blank of material, e.g., deep drawing. 3,715,902, Cl. 72-60.000.
Fugelso, Mark A. Impact switch. 3,715,985, Cl. 102-70.20r.
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Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, to Nippon Concrete Industries Co., Ltd. P.C. concrete pipe reinforcement structure. 3,716,210, Cl. 245-1.000.
Fuminier, Claude, to Societe des Fonderies De Pont-A-Mousson. Casting apparatus with regulated cooling station. 3,716,094, Cl. 164-154.000.
Furukawa Electric Company Limited, The: *See—*
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Gagnon, Richard N.; Banic, Carl V.; and Grasso, Albert P., to United Aircraft Corporation. Fuel cell electrolyte concentration control. 3,716,415, Cl. 136-86.00b.
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Garlinghouse Leslie H., to Garlinghouse Brothers. Clam shell gate action. 3,716,266, Cl. 294-71.000.
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Gatward, Albert Peter John; and Flackwell, Bronislaw Radvan, to Wiggins Teape Research & Development Limited. Method and apparatus for forming a non-woven fibrous web from a foamed fiber furnish. 3,716,449, Cl. 162-101.000.
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Gebhardt, Ronald F.: *See—*
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Gelhaar, Erik Olov Bo. Apparatus for regulating the operation of a braking device. 3,716,118, Cl. 188-181.00t.
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Geuder, Winfried, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh., Max Grundig. Cassette for magnetic tape or the like. 3,716,205, Cl. 242-194.000.
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Ghose, Rabindra N.; and Sauter, Walter A., to American Nucleonics Corporation. Instrument landing error correcting system. 3,716,863, Cl. 343s108.00r.
Giebel, Gerhard; and Fichtner, Rudi, to USM Corporation. Support for a shoe lasting machine. 3,715,768, Cl. 12-125.000.
Giesecke, Henry A., to Apromat, Incorporated. Lens system with selective image reversion. 3,716,291, Cl. 350-203.000.
Gilligan, William H.; McDonnell, Chilton H.; and Jones, Orlando, to United States of America, Navy. Process for the preparation of vinyltetrazole. 3,716,550, Cl. 260-308.00d.
Girard, Pierre, to Manufacture des Montres Rolex S.A. Display control device for timepieces. 3,715,881, Cl. 58-50.00r.
Glacier Ware, Inc.: *See—*
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Glaxo Laboratories Limited: *See—*
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Gniffke, Glenn D.; and Fratzke, Harold A., to Metro Hydraulics Inc. Tractor hitch apparatus. 3,716,253, Cl. 280-415.00a.
Godfrey, Peter James, to Fratelli Rotondi Di E. Rotondi & C. S.A.S. Measuring devices. 3,716,015, Cl. 116-115.500.
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Gorres, Thomas J., to TCI, Inc. Bogie axle. 3,716,250, Cl. 280-104.50a.
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Goserud, Chester O. Lawn mower cutters. 3,715,874, Cl. 56-295.000.
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Greene, Leonard M., to Safe Flight Instrument Corporation. Actuating and control system for gas-operated fog horn. 3,716,017, Cl. 116-137.000.
Greene, Udell T., to Diamond Shamrock Corporation. Method of dissolving liquefied chlorine in an aqueous solvent. 3,716,346, Cl. 23-312.000.
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Carver-Greenfield Corporation. Process and apparatus for recovering clean water from dilute solutions of waste solids. 3,716,458, Cl. 203-11.000.
Greeson, James C., Jr., to International Business Machines Corporation. Cathode ray tube module. 3,716,661, Cl. 178-7.800.
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Grimes, John Herbert; and Dress, William, to United Kingdom Atomic Energy Authority. Precipitation processes for metal-containing materials. 3,716,605, Cl. 264-.500.
Groberman, Leslie J.; and Wuori, Edward R., to Honeywell Inc. Apparatus for determining the damping ratio of a second order vibration system. 3,715,920, Cl. 73-194.00b.
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Guzick, Lawrence L. Orifice and filter assembly. 3,715,870, Cl. 55-466.000.

Haass, Guenther; and Reinhardt, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for interference-free recognition of the zero crossings of sine-like signals. 3,716,799, Cl. 328-150.000.

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Inamorato, Jack Thomas, to Colgate-Palmolive Company. Ternary foam control composition and built anionic detergent composition containing same. 3,716,499, Cl. 252-524.000.
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Johnston, Furnie W. Olecranon plate. 3,716,050, Cl. 128-92.00d.
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Jones, Allen Jacob, to Community Bank, The. Refractory damper for high temperature or corrosive gases. 3,716,004, Cl. 110-163.000.
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Knauseder, Franz; and Brandl, Ernst, to Biochemie Gesellschaft m.b.H. Ester derivatives of pleuromutilin. 3,716,579, Cl. 260-488.00b.
Knechtel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha. Photocopying apparatus. 3,715,944, Cl. 83-58.000.
Knechtel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha. Electrostatic quick copying apparatus. 3,716,294, Cl. 355-3.000.
Knerr, Reinhard Heinrich, to Bell Telephone Laboratories, Incorporated. Delta connected lumped element circulator. 3,716,805, Cl. 333-1.100.
Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Separation of metal carbonyl catalysts from oxo reaction mixtures. 3,716,626, Cl. 423-418.000.
Knight, Benjamin Henry: *See—*
White, David John; and Knight, Benjamin Henry, 3,715,817.
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Kobayashi, Kenzo: *See—*
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Kochavi, Jacob. Method of making a casting having an oxidized surface layer intended for use as a dental restoration. 3,716,418, Cl. 148-6.300.
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, to Industrial

Science and Technology, Agency of. Hydrogenation treatment of hydrocarbon oil. 3,716,478, Cl. 208-152.000.

Koebler, William F.; and Frank, Dale A., to Salsbury Laboratories. Package for frangible articles. 3,716,133, Cl. 206-65.00a.

Koenig, Walter; Adams, Heribert; and Heidjann, Franz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Control device for the power lifting installation of a tractor. 3,716,104, Cl. 172-7.000.

Kofluk, Russell Peter: *See—*
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Koga, Taro; Egusa, Taku; and Miyatani, Yoshihiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of erecting tower-like structure. 3,715,852, Cl. 52-745.000.

Kohler, Robert D.: *See—*
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Komninos, John; Klemchuk, Peter; and Ham, George, to Ciba-Geigy Corporation. Dyeing polyacrylonitrile with basic dyestuff and alkoxymethyl quaternary ammonium compounds. 3,716,329, Cl. 8-169.000.

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Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, to Industrial Science & Technology, Agency of. Process for the synthesis of 2,6-dimethylphenols. 3,716,589, Cl. 260-621.00r.

Koterwas, Donald J.; and Koterwas, Theodore L. Game apparatus. 3,716,233, Cl. 273-1.001.

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Kracke, Wolfgang Karl Heinrich: *See—*
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Kraftwerk Union Aktiengesellschaft: *See—*
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Krakowski, John F., to Mark 7 Seafood and Industries, Inc., mesne. Commercial food fryer and method of cleaning. 3,715,976, Cl. 99-404.000.

Kramer, Willi: *See—*
Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.

Kratzert, Friedrich, to Windmoller & Holscher. Apparatus for flattening and taking away blown tubing of plastics material. 3,716,322, Cl. 425-392.000.

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Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Valve actuating assembly. 3,716,036, Cl. 123-90.430.

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Kunkel, Donald H.; and Seymour, Donald E. Algaecide composition having improved stability. 3,716,351, Cl. 71-67.000.

Kuraray Co., Ltd.: *See—*
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Kuriyama, Sigeru; and Kikuchi, Seiki, to Hitachi, Ltd. Control device for electric automobiles including accelerator position and current feedback. 3,716,767, Cl. 318-139.000.

Kuroiwa, Yoshiro: *See—*
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Kurz, Firma, GmbH: *See—*
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Kuwana, Noriaki; Kawamura, Tamio; and Fukumura, Masayuki, to Eisai Kabushiki Kaisha. Process for the production of α-aminobenzylphenicillin. 3,716,454, Cl. 195-30.000.

Kyle, Martin L.: *See—*
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La Follette, Robert J., to Itek Corporation. Airborne radar detecting and recording system. 3,716,853, Cl. 343-5.0pr.

Laba, Eng. Mircea: *See—*
Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, 3,716,590.

Labat, Yves: *See—*
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Labatt, John Limited: *See—*
Walmsley, Martin F.; and Cross, John V., 3,716,365.

Lace, Melvin A., to Motorola, Inc. Vehicle power supply system with boltage regulator load compensation. 3,716,774, Cl. 320-64.000.

Lacey, Robert R., to Universal Oil Products Company. Vehicle seats having resilient mountings. 3,716,213, Cl. 248-399.000.

Lake, Clarence R. Collapsible sawhorse. 3,716,112, Cl. 182-155.000.

Lambert, Francois; and Bartosiak, Andrzej, to Centre Electronique de France. Colour television system for elimination of phase errors. 3,716,656, Cl. 178-5.20r.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,716,313, Cl. 418-121.000.

Lanaro, Clara M. Music teaching aid. 3,715,951, Cl. 84-470.000.

Lancellotti, Joseph J. Basketball equipment support with carrying case. 3,716,234, Cl. 273-1.50r.

Landreville, Gerald, to Dow Chemical Company, The. Apparatus and method for tamping particulate materials into a container. 3,716,081, Cl. 141-12.000.

Lang, Stewart M.: *See—*
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Lange, Henry F.; and Adler, Stuart L. Turnbuckle body. 3,716,258, Cl. 287-60.000.

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Langguth, Arthur F.: *See—*
Johnson, Clarence S.; and Langguth, Arthur F., 3,715,828.

Langner, Carl G., to Shell Oil Company. Mooring system for pipelaying barges. 3,715,890, Cl. 61-72.300.

Lardner, George E.: *See—*
Mackal, Henry H.; and Lardner, George E., 3,716,438.

Larsen, Arthur Bertel, to Bell Telephone Laboratories, Incorporated. Optical spatial frequency filter. 3,716,666, Cl. 178-5.4st.

Larson, Dale E., to Allis-Chalmers Corporation. Tapered current limit protection for D.C. motor. 3,716,772, Cl. 318-332.000.

Laskin, Harold B.: *See—*
Gorka, Donald J.; and Laskin, Harold B., 3,716,221.

Laucks, Rudolf; Fork, Werner; and Gross, Harald, to Voith, J. M., GmbH, Firma. Ship propulsion system having separate propulsion units for cruise and slow speeds. 3,716,014, Cl. 115-35.000.

Laurenz, Frank R. Selective animal gate. 3,716,032, Cl. 119-155.000.

Lautzenheiser, Robert D., to Red Cross Manufacturing, Corporation, The. Garden shredder with variable position loading chute. 3,716,090, Cl. 146-501.000.

Lautzenheiser, Robert D., to Red Cross Manufacturing Corporation, The. Shredder. 3,716,198, Cl. 241-188.00r.

Lavergne, Michel, to Institut Francais du Petrole des Carburants et Lubrifiants. Method for inducing shear waves in the earth and device therefor. 3,716,111, Cl. 181-.5rc.

Lawson, Buford Bernard. Vertical tank system for fish rearing. 3,716,025, Cl. 119-3.000.

Le Cover, Maurice. Film take-up magazine and attachment assembly therefor. 3,715,963, Cl. 95-31.00c.

Lear Siegler, Inc.: *See—*
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Leavitt, Minard A., to Cutler-Hammer, Inc. Film transport. 3,716,177, Cl. 226n1.000.

Ledergerber Alfred; and Plassmeier, Walter, to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft. Method of controlling a cycle of operations for machining a rotary workpiece. 3,715,938, Cl. 82-1.00c.

Leeds, Donald H., to Ducommun Incorporated. Carbonization of wool. 3,716,332, Cl. 423-447.000.

LeFevre, Cecil W.: *See—*
Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., 3,716,585.

LeGrand, Jesse S., to International Telephone and Telegraph Corporation. Navigation system utilizing pulse timing. 3,716,857, Cl. 343-6.8lc.

Lehmann, Hartmut: *See—*
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Leibensperger, Robert Lee; and Norris, Glen Ray, to Timken Company, The. Bearing construction with preload compensation. 3,716,280, Cl. 308-207.00a.

Lemco Plastics, Inc.: *See—*
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Lemelson, Jerome H. Reflex reflective sheeting. 3,716,445, Cl. 161-2.000.

Lenaers, Rene; De Ruiter, Ernest H.; and Vandewalle, Jan J., to Union Carbide Corporation. Process for the preparation of isocarbostyrils. 3,716,542, Cl. 260-289.00r.

Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., to Mueller Co. Method of making a coupling joint. 3,715,800, Cl. 29-506.000.

Lepine, Rene. Rotary internal combustion engine. 3,716,033, Cl. 123-8.410.

Les Usines Fabelty Societe Anonyme: *See—*
Van Der Cleyen, Rafael J. J.; and Ribbens, Wilfried F., 3,716,229.

Leschenne, Henri, to Fabrique de Ma chines Andre Bechler S. A. Automatic lathe. 3,715,939, Cl. 82-21.00b.

Lesko, Frank J., to Reynolds Metals Company. Die assembly. 3,715,904, Cl. 72-276.000.

Lesperance, Arthur J.: *See—*
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Levin, Nathan D., to Varian Associates. Input screen for image devices having reduced sensitivity in the central region. 3,716,713, Cl. 250-80.000.

Lewis, Eugene W.: *See—*
Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H., 3,715,806.

Lewis, Robert B. Learning center. 3,715,815, Cl. 35-60.000.

Lewis, Sheldon N.; and Frank, George A., to Rohm and Haas Company. Air-dried coatings compositions comprising polyester resins and a saturated aliphatic aldehyde. 3,716,508, Cl. 260-22.00a.

Lewyckyj, Roman, to Scott Paper Company. Thread-reinforced laminated structure having lines of weakness and method and apparatus for creating lines of weakness. 3,716,132, Cl. 206-58.000.

Liautaud, Jean, to Enterprise de Recherches et d'Activites Petrolieres. Device for obtaining earth samples. 3,716,107, Cl. 175-248.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
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Liepins, Janis. Mechanical power assist apparatus. 3,715,948, Cl. 83-573.000.

Lieser, Karl, to Werner, Hermann, Firma. Machine tool for cutting longitudinal groove in cylindrical work piece. 3,715,956, Cl. 90-20.000.

Liggett & Myers Incorporated: *See—*
Hall, Floyd V., 3,715,957.

Lim, Jin Twan, to Bell Canada-Northern Electric Research Limited. Negative impedance converters suitable for bilateral gain repeaters. 3,716,680, Cl. 179-170.00g.

Lim, Mahn-Jick, to Western Electric Company Incorporated. Vapor transport method for growing crystals. 3,716,405, Cl. 117-201.000.

Limb, John Ormond: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.

Lin, Kuang-Hui, to United States of America, Atomic Energy Commission. Process for decontamination of neutron-irradiated beryllium. 3,716,616, Cl. 423-134.000.

Lin, Yeong S.: *See—*
Almasi, George S.; Keefe, George E.; Lin, Yeong S.; and Thompson, David A., 3,716,781.

Lincoln, Patrick A.; and Delamater, Philip G., to Michigan Chemical Corporation. Process for substantial removal of phosphates from wastewaters. 3,716,484, Cl. 210-52.000.

Lindemann, Martin K.; and Volpe, Rocco P., to Air Products and Chemicals, Inc., mesne. Paper coating compositions and products formed therefrom. 3,716,504, Cl. 260-8.000.

Lindlof, James A., to Minnesota Mining and Manufacturing Company. Atomizing method. 3,716,190, Cl. 239-2.00s.

Lindsay, Frederick H. Unified floor-frame assembly with skirt for a mobile building. 3,716,267, Cl. 296-23.00r.

Lindstrom, Ronald E.: *See—*
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Link, Waldemar. Artificial limb for the knee joint. 3,715,763, Cl. 3-1.000.

Lions, Noel, to Commissariat a l'Energie Atomique. Device for remote positioning of thermocouples in a nuclear reactor. 3,716,450, Cl. 176-19.00r.

Little, Carl H., to Knapp, Weber, Company. Drawer front construction. 3,716,283, Cl. 312-330.000.

Little, Edwin D.; and Hirsch, Clarence A., to Allied Chemical Corporation. n-(Chlorophenoxyacetyl) ethylene urea herbicide. 3,716,554, Cl. 260-309.700.

Littlebury, Hugh W., Sr.: *See—*
Elsner, Edwin C., 3,716,115.

Littmann, Joseph C., to Dura Corporation. Gear mounted drive arm adapted to flex as cantilever beam. 3,715,931, Cl. 74-411.000.

Litton Systems, Inc.: *See—*
Phillips, Robert Matthews, 3,716,745.

Litzinger, Elmer Francis, to Brown & Williamson Tobacco Corporation. Selective gas phase filter material. 3,716,063, Cl. 131-267.000.

Litzinger, Elmer Francis, to Brown & Williamson Tobacco Corporation. Tobacco smoke filter material. 3,716,500, Cl. 260-2.10c.

Locher, Otto, to Heimo Geratebau Gesellschaft mit beschrankter Haftung. Method of and apparatus for atomizing liquid droplets in the spray jet of a spraying device. 3,716,189, Cl. 239-8.000.

Locher, Richard E. Plural rotatable disc information display device. 3,716,237, Cl. 273-142.00h.

Lochet, Jean A.: *See—*
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Loeffel, Hansrolf: *See—*
Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, 3,716,368.

Loeffler, Thomas V., to Diamond International Corporation. Compound motion egg channeling device. 3,716,127, Cl. 198-30.000.

Loew, Frederic Christian, to Inmont Corporation. Elastomeric thermoplastic polyester polyurethane compositions stabilized against hydrolysis. 3,716,502, Cl. 260-2.5ay.

Loftis, James B.; Moody, David L.; and Phillips, James H., to Robbins Machinery Company. Apparatus for settling drill dust. 3,716,108, Cl. 175-205.000.

Londahl, Dickey S.: *See—*
Martin, Thomas B., Sr.; and Londahl, Dickey S., 3,716,306.

Long, Larry K., to Advance Management Engineering & Research Co. Film advancing device. 3,716,292, Cl. 353-91.000.

Lopez, Benito; and Kornblum, Saul S., to Sandoz-Wander, Inc. Coloring compositions. 3,716,388, Cl. 106-289.000.

Lorain Electronics Corporation: *See—*
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Lowry, John D., to Ellanin Investments Ltd. Comb effect elimination. 3,716,670, Cl. 178-6.70a.

Loycano, Joseph A.: *See—*
Kefalas, John H.; and Loycano, Joseph A., 3,715,793.

Lu, Sun: *See—*
Creagh, Linda T.; Jones, Derick; and Lu, Sun, 3,716,289.

Lucas, Joseph, (Industries) Limited: *See—*
Hillyard, Peter Thomas, 3,716,813.

Ludington, Robert L.; and Holloway, Robert M. Brake mechanisms. 3,716,119, Cl. 188-195.000.

Lumsden, Alexander D., to Hoyt Wire Cloth Company. Screen. 3,716,138, Cl. 209-401.000.

Luoma, Warren L.: *See—*
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.

Lusk, George E.; and Nicholas, James H., to G. & W. Electric Specialty Company. System for dynamically cooling a high voltage cable termination. 3,716,652, Cl. 174-15.00r.

Lux, William J., to Honeywell Inc. Method of providing axially aligned molded parts in non-aligned apertured walls of a performed member. 3,716,613, Cl. 264-254.000.

Luxaire, Inc.: *See—*
Brockhurst, Woodrow W., 3,716,044.

Lynch, George W.; and Zarowin, Charles B., to International Business Machines Corporation. Inverter power supply employing series connected multi-transistor switches. 3,716,777, Cl. 321-27.00r.

Lynch, Ralph Sylvester; and Ayache, Haled Bou, to RCA Corporation. Nutation damper. 3,716,206, Cl. 244-15.00a.

Lynn, James B.; and Singleton, Alan H., to Bethlehem Steel Corporation. Process for recovering carvon monoxide from fuel gas. 3,716,619, Cl. 423-247.000.

Lynn, Robert R.: *See—*
Fagan, Castle H.; and Lynn, Robert R., 3,716,208.

Lyon, John B., to Du Pont de Nemours, E. I., and Company. Apparatus for producing flat film from thermoplastic material. 3,716,320, Cl. 425-326.000.

M & T Chemicals, Inc.: *See—*
Waggoner, Terry B.; and Seyb, Edgar J., Jr., 3,716,394.

Machii, Tetsuo: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.

Mackal, Henry H.; and Lardner, George E., to Halkey-Roberts Corporation. Grommet sealing apparatus and method. 3,716,438, Cl. 156-253.000.

Mackenzie, John, 1/2 to Sinclair, Jack. Juice extracting device. 3,715,977, Cl. 100-117.000.

Mackie, Robin William: *See—*
Schick, Rudolf; Mackie, Robin William; and Royston, Alan Lindsay, 3,716,692.

Maeda, Sanetaka, to Omron Tateisii Electronics Co. Method of manufacturing cards. 3,716,439, Cl. 156-269.000.

Magee, Philip S., to Chevron Research Company. N-acyl derivatives of phosphoroamidothioates. 3,716,600, Cl. 260-959.000.

Magne, Frank c.: *See—*
Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., 3,716,540.

Magraflux Corporation: *See—*
Graham, Bruce C.; and Dukats, Ilmars Z., 3,716,492.

Maier, Ludwig. Functional tertiary phosphine oxides. 3,716,580, Cl. 260-488.00j.

Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., to Motorola, Inc. Bandpass filter including monolithic crystal elements with resonating portions selected for symmetrical response. 3,716,808, Cl. 333-72.000.

Mallory, P. R., & Co., Inc.: *See—*
Kaye, Gordon E., 3,716,708.

Mancole Company Limited: *See—*
Coles, Manson Ivor, 3,716,304.

Mangels, Ralph W., to Daco Safety Products, Inc. Chemical ejecting flashlight. 3,716,170, Cl. 222-162.000.

Mannesmann-Meer Aktiengesellschaft: *See—*
Classen, Gunter, 3,716,323.

Manos, George, to Porta Systems Corporated. Variable timing automatic interrupter circuit for common telephone sender equipment. 3,716,674, Cl. 179-18.0fa.

Manufacture des Montres Rolex S.A.: *See—*
Girard, Pierre, 3,715,881.

Mar-Com Development, Ind.: *See—*
Comfort, Kent B., 3,716,186.

Marantette, Ruth B.: *See—*
Marantette, William F.; and Marantette, Ruth B., 3,716,716.

Marantette, William F.; and Marantette, Ruth B. Photoelectric two axis positioning system. 3,716,716, Cl. 250-203.00r.

Marcel, Henri. Stoppers for pressurized containers. 3,716,163, Cl. 215-47.000.

Marek, James John, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Flexible translator. 3,716,675, Cl. 179-18.0et.

Maremont Corporation: *See—*
Folley, Cranston Wesley; and Rocha, John Gonsalves, 3,715,955.
Wiegand, John A., 3,715,813.
Wiegand, John A., 3,715,814.

Mark, Morris. Exercising cot. 3,716,230, Cl. 272-58.000.

Mark 7 Seafood and Industries, Inc., mesne: *See—*
Krakowski, John F., 3,715,976.

Markiewitz, Kenneth H., to ICI America Inc. Trimerization of isocyanates. 3,716,535, Cl. 260-248.0ns.

Markovitz, Mark, to General Electric Company. Hardenable epoxy resin compositions. 3,716,598, Cl. 260-831.000.

Marshall, Frank J. Wire splicing device. 3,716,079, Cl. 140-120.000.

Marshavina, Natalia Lvovna: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Martell & Co.: *See—*
Ponthoreau, Marcel Maximilien; and Rozen, Claude Yves Marie, 3,716,324.

Martin, Robert M. User controlled exerciser frame. 3,716,231, Cl. 272-58.000.

Martin, Thomas B., Sr.; and Londahl, Dickey S., to Micropump Corporation. Gear pump construction. 3,716,306, Cl. 417-44.000.

Martin, Walter Harper, to Refrigeration Engineering Corporation. Poultry freezing process. 3,715,891, Cl. 62-63.000.

Martin-Marietta Corporation: *See—*
Aspland, John Richard, 3,716,325.
Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., 3,716,387.

Maruo, Keiichi: *See—*
Kawano, Toshihiko; Yamaoka, Takashi; Maruo, Keiichi; and Furutaka, Yasuhisa, 3,716,643.

Maruyama, Yoshio, to Pioneer Electronic Corporation. Tape drive reversal mechanism for tape recorder. 3,716,242, Cl. 274-4.00d.

Marx, Gerhard, to Kalle Aktiengesellschaft. Electrostatic charging and discharging apparatus. 3,716,755, Cl. 317-2.00f.

Maschinebau Oppenweiler GmbH: *See—*
Kistner, Hermann, 3,716,226.

Mason, Glenn E. Method and apparatus for harvesting fish. 3,715,831, Cl. 43-4.500.

Mason, James S., to Texas Instruments, Incorporated. Real-world perspective display for use with an independent aircraft landing monitor system. 3,716,866, Cl. 343-525.000.

Mason, William B., to General Electric Company. Control arrangement for electrically propelled traction vehicle. 3,716,768, Cl. 318-139.000.

Masopust, Otto T., Jr.: *See—*
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Massa Division, Dynamics Corporation: *See—*
Massa, Frank, 3,716,828.

Massa Division, Dynamics Corporation of America: *See—*
Barrow, Gilbert C., 3,716,681.
Massa, Frank, 3,716,827.

Massa, Frank, to Massa Division Dynamics Corporation of America. Mounting structure for spherical shaped underwater transducer. 3,716,827, Cl. 340-8.00s.

Massa, Frank, to Massa Division, Dynamics Corporation. Electroacoustic transducer with improved shock resistance. 3,716,828, Cl. 340-10.000.

Massachusetts Institute of Technology: *See—*
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Massie, Stephen N., to Universal Oil Products Company. Hybride rocket. 3,715,888, Cl. 60-251.000.

Massini, Anthony L.: *See—*
Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., 3,716,232.

Masten, Michael K.; and Choate, William C., to Texas Instruments, Incorporated. Multimodal search. 3,716,840, Cl. 340-172.500.

Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, to Westinghouse Electric Corporation. Digitally controlled wave analyzer. 3,716,785, Cl. 324-77.00b.

Masters, Keith; and Straarup, Orla, to Aktieselskabet Niro Atomizer. Liquid distributor for feeding liquid to a rotating atomizer wheel. 3,716,193, Cl. 239-222.000.

Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, to Nippon Kokan Kabushiki Kaisha. Hot rolled steel sheets for extra deep drawing. 3,716,420, Cl. 148-12.000.

Matsukawa, Koshiro: *See—*
Hoshino, Yutaka; Matsukawa, Koshiro; Nakada, Akira; and Uno, Kazuo, 3,716,594.

Matsumoto, Koichi; and Ishikawa, Makoto, to Hitachi, Ltd. Spectrophotometer. 3,716,300, Cl. 356-97.000.

Matsunaga, Tsutomu: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; Inouye, Sakae; Fujimori, Makoto; Hayashi, Noriyuki; Wada, Norio; Yoneyama, Ken; and Inaba, Hideaki, 3,716,602.

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Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.
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Matthews, Donald R.; and Holzman, Allen L., to United Aircraft Corporation. Generation of carbon dioxide having a population inversion. 3,716,342, Cl. 23-281.000.

Maurice Labbe, Francis Auguste: *See—*
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Mayer, Richard Eugene, to Allied Chemical Corporation. Anthraquinone dyed nylon stabilized with butylidene bis(butyl cresol) and polyhydroxyethyl-octadecylamines. 3,716,328, Cl. 8-165.000.

Mayes, Paul E.; and Poggio, Andrew J. Wire antenna multiply-loaded with active element impedances. 3,716,867, Cl. 343-701.000.

Mayflower Electronic Devices, Inc.: *See—*
Meenen. Raymond P., 3,716,689.

Maynard, John T. DC motor speed control with motor voltage and current sensing means. 3,716,771, Cl. 318-331.000.

Mayo, Kenneth E.: *See—*
Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., 3,716,099.

McCollum, Robert L., to Strickland, Thomas M. Removal tool for automotive radiator hose. 3,715,794, Cl. 29-235.000.

McComas, Hall R.; and Staehlin, John H., to Westinghouse Electric Corporation. Broadband slotted waveguide antenna array. 3,716,868, Cl. 343-768.000.

McCord, Philip B. Grape harvester and flexible bar. 3,715,876, Cl. 56-330.000.

McCullum, Rolland Gene, to Best Lock Corporation. Rim cylinder lock mechanism. 3,715,899, Cl. 70-369.000.

McDermid Incorporated: *See—*
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McDonald Douglas Corporation: *See—*
Wolfe, William D., Jr.; and Bowdish, Donald M., 3,716,817.

McDonnell, Chilton H.: *See—*
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McGowen, Harold E., Jr.; and Tausch, Gilbert H., to Comco Incorporated. Heat actuated well packer. 3,716,101, Cl. 166-60.000.

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Hanson, Richard M., 3,715,819.

McIntosh, Terence D.: *See—*
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McKinzie, Preston V., to Michaels of Oregon Co. Magazine tube mounting for sling swivel. 3,715,827, Cl. 42-85.000.
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Wells, Frank E., 3,716,634.
McMillen, James W.; and Rhodes, Glenn E., to Westinghouse Electric Corporation. Portable circuit breaker levering device for metal-clad switchgear. 3,716,684, Cl. 200-50.0aa.
McNickle, Bernard F.: *See—*
Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H., 3,715,806.
Mead Corporation, The: *See—*
Calvert, Rodney K., 3,716,321.
Meenen, Raymond P., to Mayflower Electronic Devices, Inc. High frequency dielectric heating process and apparatus. 3,716,689, Cl. 219-10.610.
Meffert, Alfred: *See—*
Klebe, Hans; Meffert, Alfred; Lange, Ludwig; Fratzer, Gerhard; and Dahm, Franz-Ludwig, 3,716,628.
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Morel, Rene; and Simmen, Robert, 3,715,987.
Meier, Max, to Ciba-Geigy AG. Process for the removal of metallic silver from photographic material. 3,716,362, Cl. 96-60.00r.
Meltsner, Bernard R., to Ethyl Corporation. Tris(3,5-dihydrocarbyl 4-hydroxy phenyl) phosphates. 3,716,603, Cl. 260-953.000.
Menge, Kurt, to Siemens Aktiengesellschaft. Color pyrometer. 3,715,922, Cl. 73-355.0em.
Merck & Co., Inc.: *See—*
Irving, Putter, 3,716,551.
Pives, Seemon H., 3,716,573.
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Meri, Kalju, to Electrospace Corporation. Answering machine telephone line coupling device. 3,716,673, Cl. 179-6.00r.
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Metro Hydraulics Inc.: *See—*
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Martin, Thomas B., Sr.; and Londahl, Dickey S., 3,716,306.
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Rotast, Nikita L., 3,716,761.
Middelhoek, Servaas, to N.V. Hollandse Metallurgische Industrie Billiton. Process for the preparation of vanadium carbide. 3,716,627, Cl. 423-440.000.
Mietla, Walter F., to Portec, Inc. Low clearance vehicle tiedown windlass mechanism. 3,715,994, Cl. 105-368.00t.
Miettinen, Tuure Tapio. Lapping anticondensation ventilation for windows of vehicles. 3,715,966, Cl. 98-2.180.
Milani, Louis V.: *See—*
Johnson, Donald A.; Milani, Louis V.; and Massini, Anthony L., 3,716,232.
Milchem Incorporated: *See—*
Bruson, Herman A.; and Gould, Henry, 3,716,487.
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Fader, Marshall Lloyd; and Christner, James Edward, 3,716,632.
Schut, Robert Norman, 3,716,538.
Miller, Carl A., to Economics Laboratory, Inc. Combination high pressure venturi and spray forming nozzle. 3,716,194, Cl. 239-318.000.
Miller, Ernest W. Miniature recording altimeter. 3,715,925, Cl. 73-384.000.
Miller, Eugene J. Roller align drive. 3,716,219, Cl. 259-177.00r.
Miller, Herman, Inc.: *See—*
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Miller, Russell Alan, to FMC Corporation. Process for preparing potassium peroxydisulfate. 3,716,629, Cl. 423-513.000.
Millis, Walter T., to General Electric Company. Electron discharge device. 3,716,736, Cl. 313-39.000.
Mills, Jack H.: *See—*
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Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, to Nippon Kokan Kabushiki Kaisha. Austenitic heat resisting steel. 3,716,353, Cl. 75-128.00g.
Minaguchi, Hotaka: *See—*
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Minato, Takashi: *See—*
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Potasek, Chester J.; and Hiscocks, Frank, 3,716,001.
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Minnesota Mining and Manufacturing Company: *See—*
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Mitsche, Roy T.; and Michalko, Edwards, to Universal Oil Products Company. Process for alkylating aromatic hydrocarbons. 3,716,597, Cl. 260-671.00c.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsui & Co. Ltd.: *See—*
Tanaka, Masatoshi, 3,715,776.
Mittler, Johannes; and Schardey, Karl, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for loading of cargo onto and unloading cargo from a vehicle. 3,716,157, Cl. 214-505.000.
Miyatani, Yoshihiko: *See—*
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Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, to Matsushita Electronics Corporation. High-pressure metal-vapour discharge tube. 3,716,743, Cl. 313-220.000.
Mizutani, Toshio: *See—*
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Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, to Muto Industrial Company. Automatic cutting machine. 3,715,945, Cl. 83-71.000.
Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., to United States of America, Agriculture. Hexachloropentadiene adducts of unsaturated piperazine amides. 3,716,540, Cl. 260-268.00c.

Mohr, glenn R.: *See—*
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Moist O'Matic; division of Toro Manufacturing Corporation: *See—*
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Molecular Energy Corporation: *See—*
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Moleculon Research Corporation: *See—*
Hook, Edwin O., 3,716,466.

Molina, Orlando G., 1/2 to North American Rockwell Corporation and 1/2 to Air Products and Chemicals, Inc. Dye penetrant remover. 3,716,494, Cl. 252-408.000.

Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, to Molins Limited. Cigarette-making machines of the continuous-rod type. 3,716,062, Cl. 131-110.000.

Molins Limited: *See—*
Molins, Desmond Walter; Ahern, Ronald Albert; and Maurice Labbe, Francis Auguste, 3,716,062.

Molins Machine Company Limited: *See—*
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Momota, Kenzo: *See—*
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Monsanto Company: *See—*
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Moore, Donald R.; and Tesoro, Giuliana C., to Stevens, J. P., & Co., Inc. Aryl carbonates of polyols. 3,716,572, Cl. 260-463.000.

Moore, Lee C., Corporation: *See—*
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Moore, Oliver K., to Display Corporation International. Book binding. 3,716,256, Cl. 281-29.000.

Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., to Welch Allyn Inc. Disposable light-conductive speculum. 3,716,047, Cl. 128-18.000.

Moran, John J., to Hycel, Inc. Sample fluid dispensing apparatus for chemical testing apparatus. 3,716,338, Cl. 23-259.000.

Morel, Rene; and Simmen, Robert, to Mefina S.A. Fuze for a non-gyratory projectile. 3,715,987, Cl. 102-74.000.

Morello, Edwin F., to Standard Oil Company. Polyamide-imide compositions containing guanidine salts of weak acids as bonding agents. 3,716,514, Cl. 260-33.40p.

Mori, Kunio; and Shirage, Yoshio, to Nippon Kokan Kabushiki Kaisha. Slidable mobile bridge. 3,715,769, Cl. 14-71.000.

Morinaga Milk Industry Co., Ltd.: *See—*
Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, 3,716,408.

Morio, Minoru; and Mima, Koichiro, to Sony Corporation. Color television receiver. 3,716,665, Cl. 178-5.40p.

Morrien, Albertus Marinus: *See—*
Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.

Morris, Billy R. Removable trailer hitch. 3,716,255, Cl. 280-491.00e.

Morris, John M., to Rex Chainbelt Inc. Variable voltage resilient connecting rod drive. 3,716,130, Cl. 198-220.0da.

Morrison, John R. Method of making decorative articles employing strips of flexible material. 3,716,432, Cl. 156-63.000.

Mossuto, Frank: *See—*
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Motek, Herbert; and Jobkes, Jakob, to Hazemag Hartzerkleinerungs- und Zement-Maschinenbau-Gesellschaft m.b.H. Method of operating an impact comminutor. 3,716,196, Cl. 241-27.000.

Motoren- und Turbinen-Union Muenchen GmbH: *See—*
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Motorola, Inc.: *See—*
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Mott, Ralph Beach, Sr.; Mott, Ralph Beach, Jr.; and Cantella, Richard C., to Reserv-A-Roll Co. Trash receptacle. 3,716,184, Cl. 232-43.100.

Mouroux, Claude; Peres, Gerard; and Valette, Pierre, to Compagnie Generale d'Electricite. Method of etching a metal which can be passivated. 3,716,428, Cl. 156-3.000.

Moyer, Lillian R. Hot air register. 3,715,971, Cl. 98-110.000.

Mueller Co.: *See—*
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Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,715,800.

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Muhlbach, Anton; and Fichtner, Rudi, to USM Corporation. Control mechanism for shoe lasting pincers. 3,715,767, Cl. 12-14.500.

Muller, Peter: *See—*
Scheidweiler, Andreas; and Muller, Peter, 3,716,717.

Munson, James L.: *See—*
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Murakami, Kaoru: *See—*
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Murasaki, Keisuke: *See—*
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Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, to Kokusai Denshin Denwa Co., Ltd. and Fujitsu Limited. Phase locked loop with rapid phase pull-in circuit. 3,716,802, Cl. 331-8.000.

Murray, Dudley Charles, to Pains-Wessex Limited. Pyrotechnic devices. 3,715,984, Cl. 102-34.200.

Musilek, Vladimir, to Ceskoslovenska akademie ved. Antifungal antibiotic obtained from basidimycete oudemansiella mucida and process of making the same. 3,716,635, Cl. 424-122.000.

Muto Industrial Company: *See—*
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.

Nagasawa, Taro; Kawashima, Takuji; Suzuki, Kiyoshi; and Kawase, Kouzo, to Morinaga Milk Industry Co., Ltd. Process for preparing a lactulose powder. 3,716,408, Cl. 127-46.00r.

Nagata, Wataru; and Hirai, Shoichi, to Shionagi & Co., Ltd. Derivatives of ibogamine, ibogaine and ibogaline lactams. 3,716,528, Cl. 260-239.30p.

Nakada, Akira: *See—*
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Nakada, Kusuo; and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetrons. 3,716,750, Cl. 315-39.710.

Nakai, Tetsuzo: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, 3,715,802.

Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrostatic micro copying apparatus including film cutting, slitting, and inserting means for aperture cards. 3,716,295, Cl. 355-3.000.

Nakamura, Hiroshi: *See—*
Muratani, Takuro; Okawa, Michihisa; and Nakamura, Hiroshi, 3,716,802.

Nakamura, Shinichi: *See—*
Kameoka, Akio; and Nakamura, Shinichi, 3,716,647.

Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, to Sumitomo Chemical Company, Ltd. Phenoxy carboxylic acid derivative. 3,716,583, Cl. 260-520.000.

Nakato, Hakaru: *See—*
Ooi, Hiroshi; and Nakato, Hakaru, 3,716,352.

Nakayama, Norihiko; and Osawa, Mitsuoki, to Fujitsu Limited. Display device utilization gas discharge. 3,716,742, Cl. 313-182.000.

Nanri, Nobuya: *See—*
Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, 3,716,455.

Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Method of making semiconductor devices. 3,716,429, Cl. 156-17.000.

National Cash Register Company, The: *See—*
Zurbuchen, Louis E.; and Bradam, William R., 3,715,980.

National Research Development: *See—*
Kempster, Edward, 3,716,386.

Nattsas, Stephen C.: *See—*
Gross, Leonard B.; Johnson, Charles R.; and Nattsas, Stephen C., 3,715,914.

Nazzer, Don Barkley: *See—*
Bloomsburg, Marvin S.; and Nazzer, Don Barkley, 3,716,220.

Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten: *See—*
van Staveren, Pieter, 3,715,886.

Nelson, Bobby H., to Vetco Offshore Industries, Inc. Apparatus for aligning and connecting flowlines. 3,716,100, Cl. 166-.600.

Nelson, Gerald V.: *See—*
Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,716,476.

Nelson, Lorne W., to Honeywell Inc. Fluid expandable temperature apparatus having excessive temperature relief apparatus. 3,715,924, Cl. 73-368.000.

Nemag N.V.: *See—*
van Huuksloot, Leendert, 3,716,265.

Nes, Ragnar Jonas: *See—*
Berg, Leif; and Nes, Ragnar Jonas, 3,716,154.

Neumann, Gunter: *See—*
Neumann, Gunter, 3,716,608.

Neumann, Gunter, to Neumann, Gunter. Method for restoring railway ties. 3,716,608, Cl. 264-36.000.

Neumann, Peter Gabriel, to Bell Telephone Laboratories, Incorporated. Self-synchronizing sequential encoding systems. 3,716,851, Cl. 340-347.0dd.

New Products Corporation: *See—*
Ashburn, Dillion P., 3,716,344.

Newell, E. Strohm. Device for securing a line. 3,715,782, Cl. 24-116.000.

Newell, Richard M., to Zeta Research, Inc. Pattern generator and method. 3,716,705, Cl. 235-151.000.

Newman, Nicholas S.; and Satas, Donatas. Base for adhesive tapes. 3,716,437, Cl. 156-244.000.

Ney, J. M., Company, The: *See—*
Burnett, Arthur Peter, 3,716,356.

Nicholas, James H.: *See—*
Lusk, George E.; and Nicholas, James H., 3,716,652.

Nickelson, Robert W., to Sunbeam Corporation. Vacuum cleaner. 3,715,775, Cl. 15-410.000.

Nickerson, Economos and Noonan: *See—*
Nickerson, Robert J.; and Economos, James N., 3,715,833.

Nickerson, Robert J.; and Economos, James N., to Nickerson, Economos and Noonan. Glider toy. 3,715,833, Cl. 46-79.000.

Nickols, Richard C., Jr.: *See—*
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., 3,716,609.

Niemiec, Stanley Joseph: *See—*
Heuner, Robert Charles; and Niemiec, Stanley Joseph, 3,716,723.

Niemyer, Le Roy L., Jr., to Westinghouse Electric Corporation. Apparatus for increasing signal to noise ratio in television low light level scenes. 3,716,657, Cl. 178-7.200.

Nienburg, Hans Juergen: *See—*
Kniese, Wilhelm; Nienburg, Hans Juergen; Himmele, Walter; and Aquila, Werner, 3,716,626.

Niewold, Andreas; and Pon, Judith Q., to Varian Associates. X-ray image tube having an oxidized vanadium barrier interposed between the scintillator and photocathode. 3,716,714, Cl. 250-83.300.

Nilsson, Sven Walter, to SKF Industrial Trading and Development Co. N.V. Arrangement for rectilinear guiding of a machine member along a beam. 3,716,731, Cl. 310-13.000.

Nippon Concrete Industries Co., Ltd.: *See—*
Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.

Nippon Electric Company, Limited: *See—*
Sawai, Akira, 3,716,852.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Takeuchi, Akihiko, 3,715,949.
Takeyama, Akihisa, 3,716,648.

Nippon Hoso Kyokai: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, 3,716,420.
Mimino, Tohru; Kinoshita, Kazuhisa; Tanaka, Ryohei; and Shinoda, Takayuki, 3,716,353.
Mori, Kunio; and Shirage, Yoshio, 3,715,769.

Nippon Soda Co., Ltd.: *See—*
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Nippondenso Co., Ltd.: *See—*
Suzuki, Motoji, 3,716,766.

Nishida, Koji, to Aisin Seiki Kabushiki Kaisha. Tachometer generator. 3,716,788, Cl. 324-174.000.

Nishikiori, Akira: *See—*
Tatematsu, Kenzo; Hosono, Hiroo; Katagiri, Toshio; Nishikiori, Akira; and Minato, Takashi, 3,716,676.

Nishio, Daijiro: *See—*
Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, 3,716,505.

Nissan Motor Company, Limited: *See—*
Takahashi, Koichi, 3,716,314.

Nitto Chemical Industry Co., Ltd.: *See—*
Yoshino, Takachika; Saito, Shigeru; and Sasaki, Yutaka, 3,716,496.

Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, to Wacker-Chemie G.m.b.H. Water-repellent composition for treating building materials. 3,716,399, Cl. 117-123.00d.

Niwa, Kenji: *See—*
Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, 3,716,617.

Nodera, Katsuji: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.

Nojima, Hideo: *See—*
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.

Noonan, Walter F., to Westlake Plastics Company. Electroplating barrel constructed from two disparate plastics. 3,716,470, Cl. 204-213.000.

Nordquist, Albert W., to Pratt-Read Corporation. Key construction for keyboard instruments. 3,715,950, Cl. 84-433.000.

Norman, Harold E. Apparatus for forming the crust of a pie. 3,716,319, Cl. 425-293.000.

Norris, Glen Ray: *See—*
Leibensperger, Robert Lee; and Norris, Glen Ray, 3,716,280.

Norris, Leon Frederick: *See—*
Evans, David John Ivor; Fustukian, David Alan Wayne; Norris, Leon Frederick; and Fraser, Robert William, 3,716,357.

North American Rockwell Corporation: *See—*
Molina, Orlando G., 3,716,494.

Northern Electric Company Limited: *See—*
Pieczyk, Bernhard Peter, 3,716,712.

Norton Company: *See—*
Eisner, Steve, 3,716,413.

Nouvel, Lucien. Bactericidal composition and methods employing methylene-2,2'-bis-(4-chlorothymol). 3,716,646, Cl. 424-347.000.

Novak, Lorna Beth. Color coded pronunciation symbol system. 3,715,812, Cl. 35-35.00j.

Novo Terapeutisk Laboratorium A/S: *See—*
Johnk, Poul, 3,716,578.

Nowell, John R.; and Genuit, Luther L., to Honeywell Information System. Loss of phase detector for a polyphase power system. 3,716,718, Cl. 307-13.000.

Nugent, John L.: *See—*
Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.

Nunokawa, Koji: *See—*
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N.V. Hollandse Metallurgische Industrie Billiton: *See—*
Middelhoek, Servaas, 3,716,627.

Oberlander, Georg, to Klockner-Humboldt-Deutz Aktiengesellschaft. Gas turbine power plant. 3,716,305, Cl. 417-2.000.

Oberste-Berghaus, Gerhard; and Karau, Claus-Dieter, to Bamag Verfahrenstechnik GmbH. Process for the production of nitric acid with a concentration of over 70% by weight. 3,716,625, Cl. 23-161.000.

Obregon-Gonez, Carlos F. Washing apparatus. 3,715,770, Cl. 15-23.000.

Oda, Eisuke: *See—*
Hosoda, Kirokuro; Kadowaki, Yoshio; Oda, Eisuke; and Hoshino, Nobuo, 3,716,391.

Odelberg, Stig Axel. wrapping machine for wrapping cylindrical objects. 3,715,861, Cl. 53-211.000.

Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, to Matsushita Electric Industrial Co., Ltd. Rechargeable alkaline manganese cell. 3,716,411, Cl. 136-30.000.

Oguma, Toshiro: *See—*
Hara, Toshito; and Oguma, Toshiro, 3,716,810.

Oguro, Tomokatsu: *See—*
Nakada, Kusuo; and Oguro, Tomokatsu, 3,716,750.

Ohde, Harold Herman. Clock cabinet. 3,715,882, Cl. 58-53.000.

Ohe, Keitaro; Nishio, Daijiro; Sadamtsu, Shigeru; and Kaneko, Hiroyuki, to Fuji Photo Film Co., Ltd. Process for suspension polymerization. 3,716,505, Cl. 260-17.00a.

Ohira, Tsukasa: *See—*
Ogawa, Hiromichi; Ohira, Tsukasa; Murakami, Kaoru; and Yokoyama, Takao, 3,716,411.

Ohse, Hidetaka: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.

Ohshima, Satoshi: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.

Ohta, Wasaburo; and Kasuya, Kazuhiko, to Ricoh Co., Ltd. Device for heating and fixing toner images upon a recording medium. 3,716,018, Cl. 118-101.000.

Oka, Akira. Colloid metallurgy. 3,716,358, Cl. 75-225.000.

Okamoto, Miyoshi; Mizuguchi, Shunji; and Watanabe, Koji, to Toray Industries, Inc. Process of manufacturing collagen fiber-like synthetic superfine filament bundles. 3,716,614, Cl. 264-344.000.

Okamoto, Takio: *See—*
Mizuno, Hideo; Kimura, Sadao; Akutsu, Hidezo; Yamazaki, Haruo; Okamoto, Takio; Watarai, Yoshiaki; and Baba, Shoichi, 3,716,743.

Okamura, Kunio: *See—*
Yamada, Tunehiko; Egami, Seiji; Sasatani, Harumi; Matsuoka, Hideaki; Emoto, Saburo; and Okamura, Kunio, 3,716,176.

Okawa, Michihisa: *See—*
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Oki Densen Kabushiki Kaisha: *See—*
Akachi, Hisateru, 3,715,877.

Oku, Tsurumi; Suzuki, Akio; Tawara, Nobuyoshi; and Niwa, Kenji, to Sumitomo Chemical Co., Ltd. Process for producing alumina. 3,716,617, Cl. 423-121.000.

Okumura, Shinji; Yoshinaga, Fumihiro; Kubota, Koji; and Kamijo, Hirotaka, to Ajinomoto Co., Inc. Method of producing L-histidine by fermentation. 3,716,453, Cl. 195-29.

Okuno, Yoshitosi: *See—*
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yoshitosi; and Fujimoto, Keimei, 3,716,560.

Olesen, Bernhardt D., to United States of America, Navy. Water level gauge using neutron source. 3,716,711, Cl. 250-43.500.

Olin Corporation: *See—*
Caule, Elmer J., 3,716,427.

Oliveto, Eugene Paul: *See—*
Krubiner, Alan Martin; and Oliveto, Eugene Paul, 3,716,530.

Olliges, James R., Sr., to A-T-O Inc. Washing machine. 3,715,898, Cl. 68-145.000.

O'Loughlin, James P., to Raytheon Company. Anticipatory charging regulator. 3,716,798, Cl. 328-67.000.

Olsen, Judith D.: *See—*
Kovac, Zlata; and Olsen, Judith D., 3,716,464.

Olympus Optical Co., Ltd.: *See—*
Totsuka, Yasushi; and Kamachi, Shin-Ichi, 3,716,839.

Omron Tateisii Electronics Co.: *See—*
Maeda, Sanetaka, 3,716,439.

O'Neal, Donald V., to Motorola, Inc. Cartridge locking mechanism. 3,716,243, Cl. 274-413.000.

Onishi, Masaru: *See—*
Nakajima, Yasutaka; Yamaguchi, Isao; and Onishi, Masaru, 3,716,295.

Onuki, Hiroshi: *See—*
Tanaka, Jun; and Onuki, Hiroshi, 3,716,103.

Ooi, Hiroshi; and Nakato, Hakaru, to Kawasaki Steel Corporation. Sintered desulfurizer for off-furnace use. 3,716,352, Cl. 75-58.000.

Ooishi, Tadashi: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.

Orlik, Richard D., to Chesapeake and Ohio Railway Company, The and Baltimore and Ohio Railroad Company, The. Cable reel car. 3,715,993, Cl. 105-36.700.

O'Rourke, Richard George: *See—*
Wikle, Keith Gordon; and O'Rourke, Richard George, 3,716,355.

Osawa, Koichi: *See—*
Matsudo, Kazuo; Osawa, Koichi; and Ikegami, Yoshisuke, 3,716,420.

Osawa, Mitsuoki: *See—*
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Osborn, Merlin L.: *See—*
Houze, Gerald L., Jr.; and Osborn, Merlin L., 3,716,763.

Osmonics, Inc.: *See—*
Spatz, Donald Dean, 3,716,141.

Ost, Walter; Thomas, Klaus; Jerchel, Dietric; and Appel, Karl-Richard, to Boehringer, C. H., Sohn. N-(phenyl or benzyl)-N,N'-bis-(1-amido-2,2, 2-trichloro)-ethyl) alkyleniamines. 3,716,587, Cl. 260-562.00p.

Osterling, Peter R.: *See—*
Dunlap, Scott B.; Osterling, Peter R.; and Tepper, Charles W., 3,715,986.

Ostroot, Gerald F.; and Torbarg, Robert H., to DeZurik Corporation. Assembling bellows damper unit. 3,715,798, Cl. 29-454.000.

Ota, Hiroshi. Grindstone dressing tool protection device. 3,716,041, Cl. 125-11.000.

Otani, Sugio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat treatment of molten carbonaceous material prior to its conversion to carbon fibers and other shapes. 3,716,607, Cl. 264-29.000.

Otdel Fiziki Nerazrushajuschego Kontrolya Akademii Nauk BSSR: *See—*
Akulov, Nikolai Sergeevich, 3,716,779.

Otto, C., Dr., & Comp. G.m.b.H.: *See—*
Schon, Erich F., 3,716,457.

Outboard Marine Corporation: *See—*
Von Seggern, Robert D., 3,716,116.

Owens-Illinois, Inc.: *See—*
Birner, Richard A.; Kohler, Robert D.; and Lang, Stewart M., 3,716,136.
Perry, Jack I.; and Schmader, Bernard A., 3,716,126.

Ozaki, Toshiaki: *See—*
Fujinami, Akira; Ozaki, Toshiaki; Akiba, Keiichiro; Yamamoto, Sigeo; Nodera, Katsuji; Tanaka, Katsutoshi; Kameda, Nobuyuki; and Ooishi, Tadashi, 3,716,552.

Packo, Joseph J., mesne: *See—*
Anderson, Amos R., 3,716,384.

Padmanathan, Thurairajah, to American Cyanamid Company. 1,3,2-oxazaborinides and method for preparing the same. 3,716,556, Cl. 260-326.300.

Paginton, Philip Norman: *See—*
Washbourn, Jack; and Paginton, Philip Norman, 3,716,215.

Pains-Wessex Limited: *See—*
Murray, Dudley Charles, 3,715,984.

Palazzetti, Mario, to Fiat Societa per Azioni. Thyristor ignition control device. 3,716,758, Cl. 317-96.000.

Pall Corporation: *See—*
Pall, David B.; and Jasaitis, Tadas K., 3,716,436.

Pall, David B.; and Jasaitis, Tadas K., to Pall Corporation. Process for making a back pressure resistant filter element. 3,716,436, Cl. 156-218.000.

Palmer Chemical and Equipment Company, Inc.: *See—*
Palmer, Harold C., 3,715,990.

Palmer, Harold C., to Palmer Chemical and Equipment Company, Inc. Liquid or powder dispensing dart. 3,715,990, Cl. 102-92.000.

Pangborn, Wayne O. Dice apparatus for practicing bidding and play in contract bridge. 3,716,236, Cl. 273-138.00r.

Panhard, Jean, to Societe de Constructions Mecahiques Panhard & Levassor. Rotors for rotary piston engines. 3,716,312, Cl. 418-94.000.

Papasideris, Stamos I., to Caterpillar Tractor Company. Automatic valve control mechanism for vehicle mounted implements. 3,716,159, Cl. 214-762.000.

Pappo, Raphael: *See—*
Chorvat, Robert J.; and Pappo, Raphael, 3,716,559.

Paramonoff, Elpidifor, to Standum Inc. Part feed for apparatus such as metallic can body formers. 3,715,905, Cl. 72-349.000.

Parekh, Chandra Kant, to Squibb, E. R., & Sons, Inc. Method for determining procainamide levels in blood or urine. 3,716,336, Cl. 23-230.00b.

Parish, Roger C.: *See—*
Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., 3,716,641.

Parisoe, Wilbert: *See—*
Hendrickson, Melvin C.; Merrell, Richard G.; and Parisoe, Wilbert, 3,716,654.

Park, Richard J., to Kenway Engineering Inc., mesne. Material handling system transfer assembly. 3,715,992, Cl. 104-88.000.

Park-Ohio Industries, Inc.: *See—*
Bryant, William G., 3,716,690.

Parker, Louis W. Amplitude modulation detector for radio receivers. 3,716,793, Cl. 325-487.000.

Parker-Hannifin Corporation: *See—*
Paul, John C., 3,716,075.

Parking Company of America: *See—*
Chaves, Manuel J., 3,716,183.

Parks, Kenneth J.; and Economy, Constatine F. Fastener attachment device for flexible sheet. 3,715,783, Cl. 24-265.00r.

Paro, Heemskerk: *See—*
Dekker, Cornelis; Joustra, Pieter Karel; and Paro, Heemskerk, 3,716,316.

Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., to International Business Machines Corporation. Shift register incorporating complementary field effect transistors. 3,716,724, Cl. 307-221.00c.

Parsons, George B.: *See—*
Weill, Robert L.; and Parsons, George B., 3,716,259.

P.A.S.-Artco, Inc.: *See—*
Huber, John A.; Baringer, Berlyn E.; Bruns, Eilert F.; and Ulewicz, Michael R., 3,715,903.

Pasero, Regine: *See—*
Viout, Andre; and Pasero, Regine, 3,716,633.

Passera, Walter, to Bosch, Robert, G.m.b.H. Fluidic logic device. 3,716,071, Cl. 137-594.000.

Patel, Chandra Kumar Naranbhai, to Bell Telephone Laboratories Incorporated. Television camera tube utilizing light beam scanning. 3,716,747, Cl. 315-10.000.

Patrick, William A., to Polyvend, Inc. Merchandising dispensing module for vending machines. 3,716,165, Cl. 221-85.000.

Paul, John C., to Parker-Hannifin Corporation. Power assist mechanism for fluid control valves. 3,716,075, Cl. 137-625.630.

Pawlikowski, Eugene J.: *See—*
Schonholtz, George J.; and Pawlikowski, Eugene J., 3,716,848.

Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., to Aircraft Mechanics, Inc. Inflatable grippers for brick making machines or the like. 3,716,264, Cl. 294-63.00a.

Pearne, Frank S.: *See—*
Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,716,264.

Pease, Roger Fabian Wedgwood: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.

Pelton, Norman R. Encapsulating tree seedling root systems. 3,715,835, Cl. 47-58.000.

Pentapco, Inc.: *See—*
Snyder, Benjamin L., 3,716,006.

Pepkins, Garry R. Method of forming abrasion-resistant self-lubricating coating on ferrous metals and aluminum and resulting articles. 3,716,348, Cl. 29-195.000.

Percich, Phillip P., to Amerace Esna Corporation. Hose straightening fixture. 3,716,225, Cl. 269-269.000.

Peres, Gerard: *See—*
Mouroux, Claude; Peres, Gerard; and Valette, Pierre, 3,716,428.

Perkins, Dean Roger: *See—*
Caulfield, Henry John; and Perkins, Dean Roger, 3,716,301.

Perlman, Sol J. Process for cooking foods in polyalkylene teraphalate film bag. 3,716,369, Cl. 99-1.000.

Perricone, Alphonse C., to Milchem Incorporated. Brine drilling fluid lubricant and process for drilline subterranean wells with same. 3,716,486, Cl. 11-24-72.

Perry, Donald R. Hand-starting auxiliary device for internal combustion engines. 3,716,039, Cl. 123-185.00a.

Perry, Jack I.; and Schmader, Bernard A., to Owens-Illinois, Inc. Ninety degree sweepout with automatic phasing control. 3,716,126, Cl. 198-24.000.

Peters, Clifford M. Combination high and low pressure cutoff control valve. 3,716,074, Cl. 137-625.600.

Peters, James: *See—*
Master, Harvey M.; Nugent, John L.; Hunt, Martin; and Peters, James, 3,716,785.

Peters, Kenneth, to Electric Power Storage Limited. Electric storage batteries. 3,716,412, Cl. 136-34.000.

Peterson, Anders Adolf, to Hardinge Brothers, Inc. Expanding collet and work gripping adaptor therefor. 3,716,246, Cl. 279-2.000.

Peterson, Earl A. Constantly slipping clutch control for rotary drilling. 3,716,106, Cl. 173-1.000.

Petrik, Albert V. Vertical alignment gauge. 3,715,808, Cl. 33-347.000.

Petrolite Corporation: *See—*
Redmore, Derek; and Welge, Frederick T., 3,716,569.

Petrus, Eng. Alla: *See—*
Caraculacu, Adrian, Dr.-Eng.; Petrus, Eng. Alla; and Laba, Eng. Mircea, 3,716,590.

Petyt, Colin Roderick, to Avery-Hardoll Limited and Beck & Co. (Meters) Limited. Liquid dispensing apparatus. 3,716,166, Cl. 222-15.000.

Peuschel, Gerd; and Hagedorn, Fritz, to Kali-Chemie A.G. Process of and apparatus for therometric analysis. 3,716,333, Cl. 23-230.00r.

Pezzoli, Silvestro: *See—*
Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.

Pfeil, Wolfgang: *See—*
Erb, Edgar; Habiger, Walter; Kramer, Willi; Pfeil, Wolfgang; and Weigele, Reinhold, 3,715,979.

Phelan, Louis A. M.: *See—*
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Phillips Fibers Croporation: *See—*
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Phillips, James H.: *See—*
Loftis, James B.; Moody, David L.; and Phillips, James H., 3,716,108.

Phillips Petroleum Company: *See—*
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Brady, Donnie G.; Deck, Harold R.; Jones, Faber B.; and Underwood, John H., 3,716,601.
Chapman, Charles C., 3,716,343.
Hsieh, Henry L., 3,716,495.
Hutson, Tom, Jr.; and Carter, Cecil O., 3,716,593.
Ripley, Dennis L., 3,716,545.
Venable, Charles R., Jr., 3,716,340.

Phillips, Robert Matthews, to Litton Systems, Inc. Double octave broadband traveling wave tube. 3,716,745, Cl. 315-3.600.

Pichler, Richard: *See—*
Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard, 3,716,532.

Pieczyk, Bernhard Peter, to Northern Electric Company Limited. Apparatus for and method of orienting crystal wafers. 3,716,712, Cl. 250-51.500.

Pier, Jerome R., to Westinghouse Air Brake Company. Combined electronic and fluid pressure brake control apparatus. 3,716,274, Cl. 303-20.000.

Pierce, Donald, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Fluid dynamic lift generating or control force generating structures. 3,716,209, Cl. 244-123.000.

Pierson, Gerald Pierre, to Societe Carrier. Device for spraying an electrified powdered material onto a structure. 3,716,024, Cl. 118-630.000.

Pilgrim, William S.: *See—*
Moore, William C.; Pilgrim, William S.; and Caldwell, Melvin R., 3,716,047.

Piller, Bernhard: *See—*
Froehlich, Alfred; Piller, Bernhard; and Loeffel, Hansrolf, 3,716,368.

Pillsbury, Charles H., Jr. Animal exercising device. 3,716,029, Cl. 119-29.000.

Pioneer Electronic Corporation: *See—*
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Pipes, George R., to Eaton Yale & Towne, Inc. Stacker crane order picker. 3,716,147, Cl. 214-1.0bt.

Pirson, Ewald: *See—*
Nitzsche, Siegfried; Pirson, Ewald; and Roth, Michael, 3,716,399.

Pitchon, Esra, to General Foods Corporation. Method of increasing solubility of food acidulents. 3,716,374, Cl. 99-78.000.

Pitney-Bowes, Inc.: *See—*
Eckert, Alton B., Jr.; and Jones, Howell A., Jr., 3,716,699.

Pittman, Allen G.; and Wasley, William L. Siloxane polymers for soil-repellent and soil-release textile finishes. 3,716,517, Cl. 260-46.540.

Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Siloxane polymers for soil-repellent and soil-release textile finishes. 3,716,518, Cl. 260-46.50y.

Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Preparation of fluorinated esters. 3,716,577, Cl. 260-486.00h.

Pives, Seemon H., to Merck & Co., Inc. Preparation of amino acid derivatives. 3,716,573, Cl. 260-471.00a.

Plassmeier, Walter: *See—*
Ledergerber Alfred; and Plassmeier, Walter, 3,715,938.

Plastronics, Inc.: *See—*
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Pleshko, Peter: *See—*
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Plihal, Hanns: *See—*
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Ploeger, Walter Jr.; Ploeger, Walter, Sr.; and Godigkeit, William, Jr. Three component printing ribbon and method of making same. 3,716,125, Cl. 197-172.000.

Ploeger, Walter, Sr.: *See—*
Ploeger, Walter Jr.; Ploeger, Walter, Sr.; and Godigkeit, William, Jr., 3,716,125.

Plummer, Walter A. Method of equipping a tool handle or hand grip with a tough adherent protective layer with enhanced gripping properties. 3,716,433, Cl. 156-85.000.

Pogge, Hans B.: *See—*
Ing, David W.; and Pogge, Hans B., 3,716,422.

Poggio, Andrew J.: *See—*
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Pohl, Hans-Heinrich: *See—*
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Polaroid Corporation: *See—*
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Polyvend, Inc.: *See—*
Patrick, William A., 3,716,165.

Pon, Judith Q.: *See—*
Niewold, Andreas; and Pon, Judith Q., 3,716,714.

Pont, Michel, to Rhone-Poulenc S.A. Determination of elements in organic compounds. 3,716,334, Cl. 23-230.0pc.

Ponthoreau, Marcel Maximilien; and Rozen, Claude Yves Marie, to Martell & Co. High-intensity burner for combustible gas. 3,716,324, Cl. 431-185.000.

Porta Systems Corporated: *See—*
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Portec, Inc.: *See—*
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Porter, Brooks W. Method of prearranging playing cards for educational and entertainment purposes. 3,716,238, Cl. 273-149.00p.

Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., to Stearns-Roger Corporation. Solid waste disposal method and apparatus. 3,716,002, Cl. 110-14.000.

Porter, William A.: *See—*
Porter, William I.; Hindsley, Frank W.; and Hesse, James E., 3,716,054.

Porter, William I.; Hindsley, Frank W.; and Hesse, James E., to Porter, William A. Apparatus for applying medication to teeth and body tissue. 3,716,054, Cl. 128-172.100.

Post Office, The: *See—*
Rollett, John Mortimer, 3,716,729.

Potasek, Chester J.; and Hiscocks, Frank, to Minneapolis Gas Company. Recirculating incinerator. 3,716,001, Cl. 110-8.00a.

PPG Industries: *See—*
Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., 3,716,389.

Pratt-Read Corporation: *See—*
Nordquist, Albert W., 3,715,950.

Preen, Raymond C.: *See—*
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Pregaglia, Gianfranco; Montorsi, Giorgio; Caprara, Giuseppe; and Messina, Giuseppe, to Montecatini Edison S.p.A. Process for preparing olefin oxides. 3,716,562, Cl. 260-348.50v.

Preston, Edward George, to Molins Machine Company Limited. Continuous rod making machines. 3,716,443, Cl. 156-441.000.

Price, Benjamin W. Self-propelled fishing lure. 3,715,830, Cl. 43-26.200.

Prill, Arnold L.; and Tarkan, Stuart E., to Chromalloy American Corporation. Powder metallurgy sintered corrosion and wear resistant high chromium refractory carbide alloy. 3,715,792, Cl. 29-182.700.

Prinkey, Clarence O.: *See—*
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Process for preparing the P,P-dinitrobibenzyl: *See—*
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Propst, Robert L.; and Kelley, James O., to Miller, Herman, Inc. Drawer, tray-shelf and supporting structures therefor. 3,716,282, Cl. 312-322.000.

Prouty, Robert E.; and Graf, Robert D., to Essex International, Inc. Double solenoid with interlock. 3,716,811, Cl. 335-160.000.

Pyco, Inc.: *See—*
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R-K Electric Co., Inc.: *See—*
Runge, John N.; and Krusling, Kenneth R., 3,716,756.

Raatgever, Jacob Frederik: *See—*
Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, 3,716,780.

Rackman, Michael I. Liquid-crystal television display system. 3,716,658, Cl. 178-7.30d.

Rae, Howard K., to Atomic Energy of Canada Limited. Extraction of deuterium from ammonia synthesis gas. 3,716,622, Cl. 423-248.000.

Rae, Howard Keith, to Atomic Energy of Canada Limited. Extraction of Deuterium-hydrogen monothermal exchange. 3,716,621, Cl. 423-248.000.

Raider, Jerry W., to International Business Machines Corporation. Printer hammer mechanism. 3,715,978, Cl. 101-93.00c.
Rakshys, Joseph W., Jr., to Dow Chemical Company, The. Stable carbonium ion resins and method for preparation. 3,716,501, Cl. 260-2.10e.
Rall, Dieter L.: *See—*
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Rausch, Henry, Jr.: *See—*
Williams, Milton Guy, Jr.; and Rausch, Henry, Jr., 3,716,317.
Rayburn, Charles C. Method of making a miniature metallized capacitor. 3,715,784, Cl. 29-25.420.
Rayner, Eric T.: *See—*
Fore, Sara P.; Rayner, Eric T.; and Dupuy, Harold P., 3,715,910.
Rayner, Wilfred H. G., to Clarke and Smith Manufacturing Company. Drive apparatus for tape playback apparatus. 3,716,241, Cl. 274-4.00d.
Rayonier Incorporated: *See—*
Howard, John; and McIntosh, Terence D., 3,716,574.
Raytheon Company: *See—*
O'Loughlin, James P., 3,716,798.
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RCA Corporation: *See—*
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Heuner, Robert Charles; and Niemiec, Stanley Joseph, 3,716,723.
Lynch, Ralph Sylvester; and Ayache, Haled Bou, 3,716,206.
Napoli, Louis Sebastian; and Hughes, John Joseph, 3,716,429.
Reardon, Edward A. Photographic enlarger. 3,716,298, Cl. 355-71.000.
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Lautzenheiser, Robert D., 3,716,090.
Lautzenheiser, Robert D., 3,716,198.
Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Silicon-containing aminomethyl phosphonates. 3,716,569, Cl. 260-448.80n.
Reed, Lawrence N., to Essex International, Inc. Accelerator pedal. 3,715,934, Cl. 74-560.000.
Reeder, Thomas M.; and Smith, W. Richard, to United States of America, Air Force. Acoustic surface wave resonator. 3,716,809, Cl. 333-82.00r.
Reen, Orville W., to Allegheny Ludlum Industries, Inc. High alloy steel. 3,716,354, Cl. 75-128.00w.
Rees-Memphis, Inc.: *See—*
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Refrigeration Engineering Corporation: *See—*
Martin, Walter Harper, 3,715,891.
Rehberger, Louis W.; Williams, John C.; and Demme, John P., to United States of America, Army. Epoxy fixturing. 3,716,303, Cl. 48-3.000.
Reinberger, William C., to TRW Inc. Method of reinforcing piston ring grooves. 3,715,790, Cl. 29-156.50r.
Reinecke, Gunter, to Benz & Hilgers GmbH. Apparatus for wrapping up of disc-shaped food and table luxuries, as cheese discs, chocolate bars or the like. 3,715,859, Cl. 53-209.000.
Reinhardt, Dieter: *See—*
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Reliamatic, Inc.: *See—*
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Reliance Electric Company: *See—*
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Remillard, Roland G.: *See—*
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Renault, Philippe: *See—*
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Renner, Alfred, to Ciba-Geigy. Process for removing organic substances from water. 3,716,483, Cl. 210-40.000.
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Reserv-A-Roll Co.: *See—*
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Rex Chainbelt Inc.: *See—*
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Reynolds Metals Company: *See—*
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Reynolds, Robin Francis Norman, to African Wire Ropes Limited. Valves. 3,716,069, Cl. 137-244.000.
Rheinmetall G.m.b.H.: *See—*
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Rhodes, David; and Watridge, Derek. Process for agglomerating instant coffee. 3,716,373, Cl. 99-71.000.
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Rhone-Poulenc S.A.: *See—*
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Ricci, Charles: *See—*
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Rich, Theodore A., to Environment/One Corporation. Educational atmospheric particle detector. 3,715,809, Cl. 35-19.00b.
Riches, Arthur John, to Bunker-Ramo Corporation, The. Electrical connectors. 3,716,815, Cl. 339-44.00m.
Richter, Hans-Joachim: *See—*
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Ricoh Co., Ltd.: *See—*
Ohta, Wasaburo; and Kasuya, Kazuhiko, 3,716,018.
Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Bis-pyridinium salt and a phenyl borante as photosensitive combination. 3,716,366, Cl. 96-88.000.
Rigamonti, Gianfranco: *See—*
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Riggi, Stephen Joseph: *See—*
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Rikard, Jackie D.; and Rikard, Bobby G. Worn brake indicator. 3,716,831, Cl. 340-52.00a.
Ripley, Dennis L., to Phillips Petroleum Company. Oxidative conversion including dehydrogenation. 3,716,545, Cl. 260-290.00v.
Risney, Donald R. Boat transporter. 3,716,156, Cl. 214-450.000.
Ritze, Willy, to JENer Glaswerke Schatt & Gen. Optical glasses comprising alf having a varying partial dispersion. 3,716,385, Cl. 106-47.00q.
Ritzmann, Horst; and Kruger, Wilfried, to Polysius AG. Process for heat treatment of fine granular material. 3,716,095, Cl. 165-1.000.
Robalex Inc.: *See—*
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Robertson, Richard G., to Hytek International Corporation. Process and apparatus for destroying hexavalent chromium in solution. 3,716,485, Cl. 210-50.000.
Robinson, Douglas Burton, to Cutler-Hammer, Inc. Joy-stick operator for pushbutton switch. 3,715,933, Cl. 74-471.0xy.
Robson, Frederick G.: *See—*
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Rodriguez, Arturo Perez. Circuit breaker with thermal tripping device. 3,716,757, Cl. 317-40.00r.
Rogers, Marvin E.: *See—*
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Roleshus, Rudolph L. Collapsible support member. 3,715,996, Cl. 108-144.000.
Rollett, John Mortimer, to Post Office, The. All-pass and low-pass filters comprised of active element circulators. 3,716,729, Cl. 307-295.000.
Romoser, Paul E., to Lorain Electronics Corporation. Single sideband system utilizing two tone modulation. 3,716,790, Cl. 325-49.000.
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Root, John J. Serpentine antenna mounted on a rotatable capacitive coupler. 3,716,861, Cl. 343-741.000.
Roper, Ralph E., to Wallace Expanding Machines, Inc. Method and apparatus for forming a shadow mask frame. 3,715,906, Cl. 72-354.000.
Ropin, Kurt: *See—*
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Rosinski, Edward J., to Mobil Oil Corporation. Explosive fragementation of porous solids. 3,715,983, Cl. 241-1.000.
Rotast, Nikita L., to Microsystems International Limited. Universal interconnection structure for microelectronic devices. 3,716,761, Cl. 317-101.00b.

Roth, Irving, to Sperry Rand Corporation. Vehicle height clearance indicating apparatus. 3,716,833, Cl. 340-61.000.
Roth, Michael: *See—*
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Rowbury, Dayton J., to Rowburg, Dale A. Quick release lariat honda. 3,716,031, Cl. 119-153.000.
Roy, Rustum; Henisch, Heinz K.; and White, William B. Methods of stimulating luminescence in phosphor. 3,716,741, Cl. 313-108.00r.
Roymoulik, Sunanada K., to International Paper Company. Single stage delignification and bleaching of chemical pulp with oxygen in the presence of a protector. 3,716,448, Cl. 162-65.000.
Royston, Alan Lindsay: *See—*
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Rubin, Frank F. Guarded dorsal osteotome with stabilizer. 3,716,057, Cl. 128-305.00r.
Rudder, James M., Jr. Security display case. 3,716,281, Cl. 312-114.000.
Rude, Edward T., Jr., to United States of America, Army, mesne. Firing mechanism for a multi-purpose firearm. 3,715,954, Cl. 89-127.000.
Rueffer, Harold F.; and Belard, Richard J., to Hughes Aircraft Company. Semiconductor device with protective glass sealing. 3,716,765, Cl. 317-234.00r.
Ruehle, William H., to Mobil Oil Corporation. Apparatus for and method of treating seismic data having attenuated high frequencies. 3,716,829, Cl. 340-15.5dp.
Ruggerio, Paul A., to GTE Laboratories Incorporated. Method of making photomasks of the type used in the fabricationn of microelectronic circuits. 3,716,363, Cl. 96-66.00r.
Runge, John N.; and Krusling, Kenneth R., to R-K Electric Co., Inc. Recycle prevention control circuit. 3,716,756, Cl. 317-13.00a.
Rushin, Eugene. Smog pulverizing machine. 3,715,864, Cl. 55-213.000.
Rust Furnace Company: *See—*
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Salvatori, Derald M. Button assembly. 3,715,781, Cl. 24-90.0ha.
San Fernando Electric Manufacturing Co.: *See—*
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Sanne, Odmund. Means for construction of collapsible railings. 3,716,218, Cl. 256-64.000.
Sansoni, Bruno Otto; and Kracke, Wolfgang Karl Heinrich, to Gesellschaft fur Strahlenforschung m.b.H. Method of decomposition and/or wet incineration of organic material, especially biological substances. 3,716,566, Cl. 260-412.800.
Sarbach, Jacques: *See—*
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Sato, Kenzo, to Kabushiki Kaisha Morita Seisakusho. Metal chuck for use in a dental handpiece. 3,716,247, Cl. 279-1.0sg.
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Sato, Yoshikazu; and Sato, Makoto. Tool changer for machine tool. 3,715,801, Cl. 29-568.000.
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Sawai, Akira, to Nippon Electric Company, Limited. Code conversion circuit for a two-level to multi-level code converter. 3,716,852, Cl. 340-347.0dd.
Sawano, Takahiro: *See—*
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Say, Donald L., to GTE Sylvania Incorporated. Electron gun support and shielding means. 3,716,739, Cl. 313-82.00r.
Scace, Robert I.; and Slack, Glen A., to General Electric Company. Electronic device with thermally conductive dielectric barrier. 3,716,759, Cl. 317-100.000.
Scaddan, Ernest Victor; and Heard, Alan Clifford, to International Standard Electric Corporation. Wiring dressing tool. 3,716,080, Cl. 140-124.000.
Scaggs, Orville C. Apparatus for pipe handling. 3,716,149, Cl. 214-2.500.
Schaeff, Friedrich, to Sauer, Otto, Achsenfabrik. Arrangement for stabilizing trailing vehicle axles. 3,716,249, Cl. 280-81.00a.
Schaffer, Detlef: *See—*
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Schalamon, Wesley A.; and Bacon, Roger, to Union Carbide Corporation. Process for producing carbon fibers having a high Young's modulus of elasticity. 3,716,331, Cl. 423-447.000.
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Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud (said Albrecht and said Schroder assors. to), 3,716,531.
Schick, Rudolf; Mackie, Robin William; and Royston, Alan Lindsay. Temperature controlled soldering irons. 3,716,692, Cl. 219-241.000.
Schindler, Walter, to Ciba-Geigy Corporation. 10-Oxo-10,11-dihydro-5H-dibenz 6,f azepine-5-carboxamide in the treating of epilepsy. 3,716,640, Cl. 424-244.000.
Schlatter, Gerald Lance, to International Telephone and Telegraph Corporation. Densitometer. 3,715,912, Cl. 73-32.000.
Schloemann Aktiengesellschaft: *See—*
Schussler, Ludwig, 3,715,908.
Schlumberger Technology Corporation: *See—*
Garcia, Donald J., 3,716,830.
Schmader, Bernard A.: *See—*
Perry, Jack I.; and Schmader, Bernard A., 3,716,126.
Schmid, Hermann, to Bosch, Robert, G.m.b.H. Temperature-dependent time-delay switch. 3,716,034, Cl. 123-32.0ea.
Schmidt, Felix Hehmut: *See—*
Heerdt, Ruth; Hubner, Manfred; Schmidt, Felix Hehmut; and Weyer, Rudi, 3,716,537.
Schmidt, Gerhard: *See—*
Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, 3,716,395.
Schmidt, Otto, to Siemens Aktiengesellschaft. Crucible-free zone melting device having an angled heating coil. 3,716,341, Cl. 23-273.0sp.
Schmitt, Joseph W.; and Starkey, Donald L., to Sanders Associates, Inc. Modular signal processor. 3,716,843, Cl. 340-172.500.
Schneider, Richard S.: *See—*
Ullman, Edwin F.; and Schneider, Richard S., 3,716,335.
Schnell, Hermann: *See—*

Darsow, Gerhard; and Schnell, Hermann, 3,716,549.

Schnellman, Oscar; and Stier, Henry Willy, to Carmet Company. Automatic profile grinding machine with an indexing mechanism. 3,715,841, Cl. 51-165.880.

Schohl, Paul. Automatic bagger of groceries sundries. 3,715,862, Cl. 53-390.000.

Scholes, William George: *See—*
Connor, Denis John; Limb, John Ormond; Pease, Roger Fabian Wedgwood; and Scholes, William George, 3,716,667.

Scholl, Inc.: *See—*
Johnston, John, 3,716,503.

Scholl, Ronald F.; and Bleha, William P., Jr., to Hughes Aircraft Company. Method for making a cadmium sulfide thin film sustained conductivity device. 3,716,406, Cl. 117-217.000.

Schon, Erich F., to Otto, C., Dr., & Comp. G.m.b.H. Apparatus for preventing air pollution during coke oven discharge. 3,716,457, Cl. 202-263.000.

Schonholtz, George J.: *See—*
Schonholtz, George J.; and Pawlikowski, Eugene J. (said Pawlikowski assor. to said), 3,716,848.

Schonholtz, George J.; and Pawlikowski, Eugene J., said Pawlikowski assor. to said Schonholtz, George J. Small portable paging receiver with audio recording and reproducing facilities. 3,716,848, Cl. 340-311.000.

Schoolar, Richard B., to United States of America, Navy. Method of preparation of lead sulfide PN junction diodes. 3,716,424, Cl. 148-175.000.

Schrenk, Walter J.; Cleereman, Kenneth J.; Chisholm, Douglas S.; and Alfrey, Turner, Jr., to Dow Chemical Company, Limited. Method for the formation of composite plastic bodies. 3,716,612, Cl. 264-241.000.

Schroder, Eberhard: *See—*
Albrecht, Rudolf; Schroder, Eberhard; and Muftic, Mahmoud, 3,716,531.

Schroeder, Paul G. K.: *See—*
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Schuh, Eduard: *See—*
Kelch, Heinz; and Schuh, Eduard, 3,716,185.
Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.

Schultz, Robert L.: *See—*
Hayes, Arthur F.; and Schultz, Robert L., 3,716,696.

Schultze, Wolfram M., to Plastronics, Inc. Support apparatus for a bedside drainage bag. 3,716,055, Cl. 128-275.000.

Schur, George O. Heat vapor differential engine. 3,715,885, Cl. 60-25.000.

Schussler, Ludwig, to Schloemann Aktiengesellschaft. Forging manipulators. 3,715,908, Cl. 72-420.000.

Schut, Robert Norman, to Miles Laboratories, Inc. Aminomethylphenylbicyclononenols. 3,716,538, Cl. 260-268.0bc.

Schwartz, Reinhard: *See—*
Bosch, Walter; and Schwartz, Reinhard, 3,716,064.

Schwarz, Maurice: *See—*
Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard, 3,716,532.

Schweiger, Richard G., to Grain Processing Corporation. Refining of hemicelluloses. 3,716,526, Cl. 260-212.000.

Schweikl, Ludwig; and Japs, Alfred, to Motoren- und Turbinen-Union Muenchen GmbH. Aircraft with one or several turbojet engines housed in the fuselage aft section or in pods provided with thrust-reversing devices. 3,716,207, Cl. 244-53.00r.

Scott, Daniel G.: *See—*
Wilson, Richard L.; and Scott, Daniel G., 3,716,276.

Scott Paper Company: *See—*
Lewyckyj, Roman, 3,716,132.

Scott, William J.: *See—*
Erik, Carl L.; and Scott, William J., 3,716,318.

Scovill Manufacturing Company, mesne: *See—*
Chivers, James R., 3,716,169.

Sealectro Limited: *See—*
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Searle, G. D., & Co.: *See—*
Chorvat, Robert J.; and Pappo, Raphael, 3,716,559.

Searle, G. E., & Co.: *See—*
Hershenson, Fred M., 3,716,548.

Sears, Noel C.; and Remillard, Roland G., to Sprague Electric Company. Sorting device. 3,716,135, Cl. 209-74.000.

Security Patent Anchor Company Limited, The: *See—*
Wright, Kenneth L., 3,716,012.

Seeburg Corporation of Delaware, The: *See—*
Dabrowski, Casimer J., 3,716,124.

Seglem, Omund A.: *See—*
Grauer, Oscar H.; Seglem, Omund A.; and Kaucher, Erwin K., 3,715,921.

Seifried, Paul, to Rheinmetall G.m.b.H. Firearm magazine releasing lever and trigger safety. 3,715,826, Cl. 42-70.00e.

Senju Metal Industry Co., Ltd.: *See—*
Tanaka, Jun; and Onuki, Hiroshi, 3,716,103.

Serewicz, Aubrey J., to Illinois Tool Works Inc. Panel insert and method of installation. 3,716,092, Cl. 151-41.700.

Setalvad, Jagdish Ishwarlal: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Seyb, Edgar J., Jr.: *See—*
Waggoner, Terry B.; and Seyb, Edgar J., Jr., 3,716,394.

Seymour, Donald E.: *See—*
Kunkel, Donald H.; and Seymour, Donald E., 3,716,351.

Sha, Richard T.; and Tang, Donald T., to International Business Machines Corporation. Recursive automatic equalizer and method of operation therefore. 3,716,807, Cl. 333-18.000.

Shah, Krishnakant Girdharla: *See—*
Dutta, Subodh Krishna; Shah, Krishnakant Girdharla; and Setalvad, Jagdish Ishwarlal, 3,716,326.

Shark, Sam: *See—*
Fischbein, Harold; Fischbein, Irving George; and Shark, Sam, 3,716,007.

Sharki, Martin J.; and Griffin, Phil H., to Dresser Industries, Inc. Pneumatic ratemeter and counter. 3,716,707, Cl. 235-200.000.

Sharp, Theo F., to Reliance Electric Company. Speed reducer. 3,715,932, Cl. 74-42.00s.

Shell Oil Company: *See—*
Langner, Carl G., 3,715,890.

Sheridon, Nicholas K., to Xerox Corporation. Cyclic recording system by the use of an elastomer in an electric field. 3,716,359, Cl. 96-1.100.

Sherman, Alan E., to Aranar Marketing Services, Inc. Key retainer. 3,715,900, Cl. 70-456.00r.

Sherman, James Webster; and Jenkins, Terry Allen, to Johns-Manville Corporation. Flexible duct connection. 3,716,077, Cl. 138-134.000.

Shibata, Fumio: *See—*
Kitamura, Kazuo; Takabayashi, Fumiki; and Shibata, Fumio, 3,716,330.

Shideler, Harold W.: *See—*
Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., 3,716,002.

Shigaki, Masanobu; Kido, Shigehiro; and Chiba, Yoshikazu, to Takuma Kikan Mfg. Co. Hydrogen chloride recovery incinerator for plastics containing hydrogen and chlorine. 3,716,339, Cl. 23-262.000.

Shimada, Kazuo: *See—*
Kodera, Yoshihide; Kato, Jun; Shimada, Kazuo; Suzuki, Morio; Ohse, Hidetaka; Ohshima, Satoshi; and Kiriki, Yasunori, 3,716,478.

Shimizu, Tamio: *See—*
Mochizuki, Takashi; Komatsuzaki, Yoshinori; Hara, Satoshi; Nojima, Hideo; Shimizu, Tamio; and Suzuki, Shigeo, 3,715,945.

Shimmin, Lawrence E., to Copley Press, Inc. Web guiding and corner folding apparatus. 3,716,178, Cl. 226-11.000.

Shimokawa, Katsuyoshi: *See—*
Kotanigawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, 3,716,589.

Shimotake, Hiroshi: *See—*
Cairns, Elton J.; Kyle, Martin L.; and Shimotake, Hiroshi, 3,716,409.

Shinoda, Takayuki: *See—*
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Shionagi & Co., Ltd.: *See—*
Nagata, Wataru; and Hirai, Shoichi, 3,716,528.

Shirage, Yoshio: *See—*
Mori, Kunio; and Shirage, Yoshio, 3,715,769.

Shirano, Kenji; and Yoshitake, Toshihiko, to Kuraray Co., Ltd. Process for producing polyesters of improved rubber adhesion and product. 3,716,396, Cl. 117-76.00t.

Shirk, Brian Thomas, to Stackpole Carbon Company. Hard magnetic ferrites. 3,716,630, Cl. 423-594.000.

Shrader, Delworth. Meter power distribution apparatus for mobile homes with a detachable front panel for power outlet fitting. 3,716,762, Cl. 317-107.000.

Shulz, Robert J., to Vischer Products Company. Steam generator control. 3,716,188, Cl. 236-92.000.

Shwayder, Benjamin H., to Shwayder Chemical & Metallurgy Corporation. Drill proof plates. 3,715,999, Cl. 109-82.000.

Shwayder Chemical & Metallurgy Corporation: *See—*
Shwayder, Benjamin H., 3,715,999.

Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,716,565.

Siegener Aktiengesellschaft: *See—*
Vollhardt, Forhmut, 3,716,045.

Sieja, James Bernard, to Du Pont de Nemours, E. I., and Company. Thiadiazoles [3,4-d] pyridazines. 3,716,534, Cl. 260-250.00a.

Siemens Aktiengesellschaft: *See—*
Brunner, Julius, 3,716,769.
Dangschat, Rainer, 3,716,776.
Grabmaier, Josef, 3,716,345.
Groschwitz, Eberhard, 3,716,804.
Haass, Guenther; and Reinhardt, Dieter, 3,716,799.
Kausche, Helmold, 3,716,472.
Kraus, Artur, 3,716,746.
Menge, Kurt, 3,715,922.
Schmidt, Otto, 3,716,341.

Sievert, William C.: *See—*
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Signouret, Jean-Baptiste: *See—*
Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,716,588.

Silbert, Leonard S., to United States of America, Agriculture. Process for the preparation of alkyl, perfluoroalkyl and aryl iodides. 3,716,592, Cl. 260-650.00r.

Silman, Harold: *See—*
Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, 3,715,838.
Silva, George E. Extension hand sprayer device. 3,716,195, Cl. 239-375.000.
Silvestri, Anthony J.: *See—*
Weisz, Paul B.; and Silvestri, Anthony J., 3,716,479.
Simjian, Luther G., to General Research Inc. Control and recording apparatus. 3,716,698, Cl. 235-61.100.
Simmen, Robert: *See—*
Morel, Rene; and Simmen, Robert, 3,715,987.
Simmons, Kenneth D.; Allen, Henry W.; and Gebhardt, Ronald F., to Martin-Marietta Corporation. Cement clinker production. 3,716,387, Cl. 106-100.000.
Simms, John A.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Process for preparing aziridiny l alkyl-acrylate or methacrylate graft copolymers. 3,716,506, Cl. 260-22.0cb.
Simon, Horst; and Kollgus, Heinrich, to Eastman Kodak Company. Camera mechanism adapted to fire mechanically-actuable flash units. 3,715,960, Cl. 95-11.50r.
Simons, John Roger, to Bunker Ramo Corporation. Battery clock wind device. 3,715,880, Cl. 58-41.000.
Simpson, Arnold J.: *See—*
Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., 3,716,349.
Sims, David S.: *See—*
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Sinclair, Jack: *See—*
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Singer-General Precision, Inc.: *See—*
Friedman, David, 3,716,660.
Singleton, Alan H.: *See—*
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Siviour, Neil Graham: *See—*
Cullen, Geoffrey Victor; Graham, John William; and Siviour, Neil Graham, 3,716,471.
Skau, Evald L.: *See—*
Mod, Robert R.; Magne, Frank c.; and Skau, Evald L., 3,716,540.
SKF Industrial Trading and Development Co. N.V.: *See—*
Nilsson, Sven Walter, 3,716,731.
Skogsholm, Einar Aasen, to General Electric Company. Short circuit protection means for power circuits. 3,716,775, Cl. 321-5.000.
Skoog, Folke E. Invalid support. 3,716,067, Cl. 135-45.00a.
Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock brake systems for wheeled vehicles. 3,716,275, Cl. 303-21.0af.
Skydyne, Inc.: *See—*
Weill, Robert L.; and Parsons, George B., 3,716,259.
Slack, Glen A.: *See—*
Scace, Robert I.; and Slack, Glen A., 3,716,759.
Slick, Edward C.: *See—*
Burkhart, John H.; and Slick, Edward C., 3,716,421.
Sloeva, Galina Nikolaevna: *See—*
Belkin, Nikolai Vasilievich; Alexandrovich, Eduard-Gely Vitalievich; Razin, Anatoly Alexandrovich; Kanunov, Mikhail Alexeevich; Tsukerman, Veniamin Aronovich; Sloeva, Galina Nikolaevna; Tsvetkov, Leonard Vasilievich; and Dron, Ninel Alexeevna, 3,716,737.
Slominski, Walter V., to Hoover Ball and Bearing Company. Connector and stiffener member for intersecting wires. 3,715,766, Cl. 5-247.000.
Sloter, James W. Vehicle towing means. 3,716,152, Cl. 214-86.00a.
Small, Edward R.: *See—*
Hirai, Robert K.; Boomer, John H.; and Small, Edward R., 3,715,943.
Smith, Alexander Steel; and Bailey, Ernest Arthur. Bags and bag-supplying apparatus. 3,715,854, Cl. 53-29.000.
Smith, Craig P.: *See—*
Malinowski, Stanley; Dailing, James L.; and Smith, Craig P., 3,716,808.
Smith, David Henry: *See—*
Salter, David Stanley; and Smith, David Henry, 3,716,459.
Smith, Floyd Reed. Stook invertor. 3,716,175, Cl. 214-768.000.
Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., to Allegheny Ludlum Industries, Inc. Grounding rod and coupler therefor. 3,716,649, Cl. 174-7.000.
Smith Klint, & French Laboratories: *See—*
Actor, Philip P.; Parish, Roger C.; and Theodorides, Vassilios J., 3,716,641.
Smith, Leslie V. Conical radiant orchard heater. 3,716,042, Cl. 126-59.500.
Smith, W. Richard: *See—*
Reeder, Thomas M.; and Smith, W. Richard, 3,716,809.
Snitzer, Elias: *See—*
Deeg, Emil W.; Snitzer, Elias; and Simpson, Arnold J., 3,716,349.
Snowden, Bryan T., to Food Equipment, Inc. Fowl singeing system utilizing oscillating flames. 3,715,779, Cl. 17-11.000.
Snyder, Benjamin L., to Pentapco, Inc. Attachment for the button clamp of button sewing machines, for holding a shank tube to be sewn on together with the button. 3,716,006, Cl. 112-114.000.
Societa Italiana Resine S.p.A.: *See—*
Calcagno, Benedetto; and Ghirga, Marcello, 3,716,581.
Vargiu, Silvio; Pezzoli, Silvestro; and Abruzzi, Pierluigi, 3,716,512.
Societe Anonyme dite: L'Oreal: *See—*
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Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
Esclamadon (, Christian; Labat, Yves; and Signouret, Jean-Baptiste, 3,716,588.
Societe Carrier: *See—*
Pierson, Gerald Pierre, 3,716,024.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Van Pottelsberghe de La Potterie, Pierre Joseph, 3,716,379.
Van Pottelsberghe de La Potterie, Pierre Joseph, 3,716,380.
Societe de Constructions Mecahiques Panhard & Levassor: *See—*
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Societe des Fonderies De Pont-A-Mousson: *See—*
Fuminier, Claude, 3,716,094.
Societe E. Lacroix: *See—*
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Sogo, Satoru: *See—*
Fukushima, Yoshikiyo; Ishihara, Yasushi; Momota, Kenzo; Usui, Yasuo; Sakumura, Tuyoshi; Sogo, Satoru; and Nunokawa, Koji, 3,716,210.
Sohoma, Takeyoshi, to Denki Onkyo Co., Ltd. Saturable reactor for correcting raster distortion. 3,716,748, Cl. 315-27.0sr.
Sola Basic Industries, Inc.: *See—*
Broekhuysen, William C., 3,716,814.
Solartron Electronic Group Limited, The: *See—*
Metcalf, Eric, 3,716,849.
Sonex, Inc.: *See—*
Weinberg, Harold; Rogers, Marvin E.; Dadario, Michael G.; and Benson, James A., 3,716,835.
Sony Corporation: *See—*
Morio, Minoru; and Mima, Koichiro, 3,716,665.
South African Inventions Development Corporation: *See—*
Anderson, Ernest Leslie, 3,715,892.
Southwire Company: *See—*
Cofer, Daniel B., 3,716,423.
Soyka, Manfred: *See—*
Wilhelm, Gerhard; Hockenberger, Lothar; and Soyka, Manfred, 3,716,515.
Spain, Virginia L.; and Diekman, John D., to Zoecon Corporation. Aza aliphatic esters. 3,716,564, Cl. 260-404.000.
Spampinato, Dominic P.: *See—*
Parrish, James T.; Spampinato, Dominic P.; and Terman, Lewis M., 3,716,724.
Spatz, Donald Dean, to Osmonics, Inc. Solvent separating apparatus. 3,716,141, Cl. 210-194.000.
Spauszus, Siegfried: *See—*
Kelch, Heinz; Krickl, Josef; Schuh, Eduard; and Spauszus, Siegfried, 3,716,700.
Speakman, Edwin L., to Standard Brands Incorporated. Process for producing formaldehyde-treated starch free of unreacted or free formaldehyde. 3,716,527, Cl. 260-233.30a.
Spectral Data Corporation: *See—*
Yost, Edward F., Jr., 3,715,962.
Speedine Partnership: *See—*
King, Leonard Tony, 3,715,975.
Spence, Hilton W.: *See—*
Stehlin, Robert A.; and Spence, Hilton W., 3,716,727.
Sperry Rand Corporation: *See—*
Caulfield, Henry John; and Perkins, Dean Roger, 3,716,301.
Colby, Kenneth G.; and Riggs, Robert F., 3,716,749.
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Sprague Electric Company: *See—*
Kahn, Manfred, 3,716,407.
Sears, Noel C.; and Remillard, Roland G., 3,716,135.
Spriet, Roger Alois: *See—*
Thiers, Robrecht Julius; Willems, Jozef Frans; and Spriet, Roger Alois, 3,716,361.
Springer, Reinhard; Drescher, Kurt; and Jahn, Eberhard, to Arbeitsstelle fur Molekularelektronik. Method and electronic circuit arrangement for producing photomasks. 3,716,296, Cl. 355-53.000.
Squibb, E. R., & Sons, Inc.: *See—*
Parekh, Chandra Kant, 3,716,336.
St. Denis, Andrew Raoul. Digital control device for strip metal feeder. 3,716,773, Cl. 318-600.000.
St. John, Daniel S.; and Haines, Kenneth A., to Holotron Corporation. Holographic television record system. 3,716,286, Cl. 350-3.500.
Staar, Marcel Jules Helene. Apparatus for controlling advance of a record support and transverse displacement of a sensing head. 3,716,678, Cl. 179-100.20t.
Stackpole Carbon Company: *See—*
Dippold, William L., 3,716,735.
Shirk, Brian Thomas, 3,716,630.
Staehlin, John H.: *See—*
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Stamicarbon N.V.: *See—*
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Standard Brands Incorporated: *See—*
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Standard Oil Company: *See—*
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Morello, Edwin F., 3,716,514.
Standum Inc.: *See—*
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Stanley Works, The: *See—*
West, Robert F., 3,716,201.

Starkey, Donald L.: *See—*
Schmitt, Joseph W.; and Starkey, Donald L., 3,716,843.

Stearns-Roger Corporation: *See—*
Porter, Stuart M.; Weimer, Ervin C.; and Shideler, Harold W., 3,716,002.

Steggerda, Jan Frederik; and Houtman, Ary Cornelis, to U.S. Philips Corporation. Use of radioactive compounds to determine fat absorption. 3,716,631, Cl. 424-1.000.

Stehlin, Robert A.; and Spence, Hilton W., to Texas Instruments, Incorporated. Switched amplification system having radiation compensation circuitry. 3,716,727, Cl. 307-243.000.

Stein, Bernard: *See—*
Deschamps, Nicholas H.; Stein, Bernard; and Mayo, Kenneth E., 3,716,099.

Stephens, Harvey. Air brake release. 3,716,277, Cl. 303-70.000.

Stevens, Harrison: *See—*
Smith, George A.; Stevens, Harrison; Walker, Robert R.; and Boyd, Gilbert D., 3,716,649.

Stevens, J. P., & Co., Inc.: *See—*
Kolsky, Rodger E.; and Chase, Vernon Lindsay, 3,716,488.
Moore, Donald R.; and Tesoro, Giuliana C., 3,716,572.

Stickney, Fernald S., to Instrument Specialties Company, Inc. Grips for holding specimens. 3,715,916, Cl. 73-103.000.

Stier, Henry Willy: *See—*
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Stoll, H., and Company: *See—*
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Stone & Webster Engineering Corporation: *See—*
Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, 3,716,451.

Stone Industrial Corporation: *See—*
Keith, M. Robert; and Barnes, Richard C., 3,716,733.

Stover, Harris A., to Collins Radio Company. ILS receiver for aircraft with distortion warning or elimination. 3,716,864, Cl. 343-108.00r.

Straarup, Orla: *See—*
Masters, Keith; and Straarup, Orla, 3,716,193.

Straley, James M.: *See—*
Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., 3,716,327.

Strassle, Marcel Rudolf. Building construction. 3,715,849, Cl. 52-646.000.

Straus, Albert E., to General Partilion Manufacturing. Panel and extrusion combination. 3,715,847, Cl. 52-400.000.

Strickland, Alvah T., to United States of America, Navy. Variable buoyancy control system. 3,716,009, Cl. 114-16.00e.

Strickland, Thomas M.: *See—*
McCollum, Robert L., 3,715,794.

Strong, Philip L.; Hunter, Don L.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Alkoxy trifluoromethylaniline compounds. 3,716,585, Cl. 260-574.000.

Strongin, Grigory Mikhailovich: *See—*
Berlin, Alfred Anisimovich; Kefeli, Tamara Yakovlevna; Marshavina, Natalia Lvovna; Strongin, Grigory Mikhailovich; Kara-Giaur, Nikolai Vladimirovich; Kolomazov, Boris Ivanovich; Efimov, Alexei Vasilievich; Bodrova, Aglaida Nikolaevna; and Altshuler, Judif arkovna, 3,716,571.

Stueber, Richard J.; and Klach, Stanley J., to Chromalloy American Corporation. Impact resistant coatings for nickel-base and cobalt-base superalloys and the like. 3,716,398, Cl. 117-107.20p.

Sturdivan, Paul G.: *See—*
Finley, Bruce M.; and Sturdivan, Paul G., 3,716,480.

Sued-West-Chemie GmbH: *See—*
Bauer, Hans; Holzer, Helmut; and Schmidt, Gerhard, 3,716,395.

Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzo, to Tokyo Shibaura Electric Co., Ltd. Semiconductor apparatus and method for manufacturing the same. 3,715,802, Cl. 29-588.000.

Sugiyama, Kazuhiro: *See—*
Ando, Fumio; Kitahama, Hideharu; and Sugiyama, Kazuhiro, 3,716,440.

Sukup, Eugene G. Apparatus for heating grain or the like. 3,715,973, Cl. 99-8.000.

Sullhofer, Heinz. Self-supporting insulating elements. 3,715,846, Cl. 52-309.000.

Sumitomo Chemical Co., Ltd.: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*
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Suzuki, Motoji, to Nippondenso Co., Ltd. Cooperative system of windshield washer and wiper with intermittent wiper operating mechanism. 3,716,766, Cl. 318-102.000.

Suzuki, Shigeo: *See—*
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Takeda, Yutaka: *See—*
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Takei, Toru; Kawai, Yasutaka; and Matsushima, Takeshi, to Matsushita Electric Industrial Co., Ltd. Starter device for a discharge lamp. 3,716,751, Cl. 315-106.000.

Takeuchi, Akihiko, to Nippon Gakki Seizo Kabushiki Kaisha. Musical instrument using a fluid powered tone generator for generating sonic energy. 3,715,949, Cl. 84-330.000.

Takeyama, Akihisa, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments provided with a circuit for generating a tremolo effect. 3,716,648, Cl. 84-1.250.

Takkunen, Philip D.: *See—*
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Tarvin, Edward M. Detachable folding camper steps. 3,716,254, Cl. 280-166.000.

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Termin, Erich; and Hauck, Gerhard, to Dynamit Nobel AG. Simultaneous production of alcoholates and trivalent titanium complexes of beta-diketones. 3,716,567, Cl. 260-429.500.
Terry, Peter L.: *See—*
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Terwilliger, H. Alan. Rotary plug shut-off valve assembly. 3,716,073, Cl. 187-613.000.
Terzuoki, Dominick. Paper bag construction. 3,716,181, Cl. 229-57.000.
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Thomas, Charles C., to Mississippi State University Development Foundation, Inc. Magnetically attracted bobbins. 3,716,202, Cl. 242-118.700.
Thomas, Douglas W., to American Home Products Corporation. Safety closure device. 3,716,160, Cl. 215-9.000.
Thomas, Klaus: *See—*
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Thompson, Philip, Jr. Mowing apparatus. 3,715,872, Cl. 56-10.400.
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Toray Industries, Inc.: *See—*
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Townsend, john K.; and Sanford, Chester E., to Vistron Corporation. Process for preparing striped sheet material continuously. 3,716,431, Cl. 156-62.400.
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Trimpler, Walter, to DIEHL. Synchronous alarm clock. 3,715,883, Cl. 58-21.150.
Trocciola, John C.; Luoma, Warren L.; Nickols, Richard C., Jr.; and Emanuelson, Roger C., to United Aircraft Corporation. Process for preparing molded structure from polyphenylene sulfide resin and filler. 3,716,609, Cl. 264-111.000.
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Tscharner, Christopher; Schwarz, Maurice; and Pichler, Richard. Process for preparing crystalline forms of 4,4'-bis [(4-anilino-6-morpholino-1,3,5-triazin-2 -yl)-amino]-stilbene-2,2'-disulfonic acid. 3,716,532, Cl. 260-240.100.
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Turner, Abner B., to Westinghouse Electric Corporation. Waste treatment system. 3,716,139, Cl. 210-104.000.
Turolla, Marco. Ring seal. 3,716,245, Cl. 277-176.000.
Tuttle, James W.: *See—*
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Tuuha, Rolf Erik. Lock gate of the removal end of a barking drum. 3,716,087, Cl. 144-208.00b.
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Ueda, Seinosuke; Nanri, Nobuya; and Hongo, Motoyoshi, to Hayashibara Co., Ltd. Method for producing isoamylase by fermentation. 3,716,455, Cl. 195-66.00r.
Uelzmann, Heinz, to General Tire & Rubber Company, The. 1,2-epithio-3-(β-cyanoethoxy) propane. 3,716,557, Cl. 260-327.00e.
Ueno Pharmaceutical Co., Ltd.: *See—*
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Ueno, Ryuzo; Miyazaki, Tetsuya; and Inamine, Shigeo, to Ueno Pharmaceutical Co., Ltd. Method of preserving meat and fish with a granular sorbic acid food preservative. 3,716,381, Cl. 99-157.000.
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Van Elk, Cornelis Johannes; Raatgever, Jacob Frederik; Morrien, Albertus Marinus; and Dirk van der Lee, Jan Gijsbert, to U.S. Philips Corporation. System for the accurate reproduction of pulse code modulation signals received as an unpavourable signal-to-nise ratio. 3,716,780, Cl. 325-324.000.
van Huuksloot, Leendert, to Nemag N.V. Grab. 3,716,265, Cl. 294-70.000.
Van Pottelsberghe de La Potterie, Pierre Joseph, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of beef and chicken flavouring agents. 3,716,379, Cl. 99-140.00n.
Van Pottelsberghe de La Potterie, Pierre Joseph, to Societe d'Assistance Technique pour Produits Nestle S.A. Beef flavour. 3,716,380, Cl. 99-140.00n.
Van Sickel, Alfred L.; Mitchell, Errol S.; and Rigamonti, Gianfranco, to Stone & Webster Engineering Corporation. Nuclear reactor power plant structural support system. 3,716,451, Cl. 176-65.000.
van Staveren, Pieter, to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten. Gas turbine installation with a centrifugal fluid vanes compressor. 3,715,886, Cl. 60-39.18r.
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Volckari, Peter; Lehmann, Hartmut; and Hafner, Raimund, to Kienzle Apparate GmbH. Connector sheet with contacts on opposite sides. 3,716,846, Cl. 340-174.00m.

Volkswagenwerk Aktiengesellschaft: *See—*
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Von Seggern, Robert D., to Outboard Marine Corporation. Automatic hydraulically operated seat brake. 3,716,116, Cl. 188-109.000.

Voskuil, Donald J.; Knudtson, John P.; and Krupp, Myron J., to PPG Industries. Pigment composition and its use in electrodeposition. 3,716,389, Cl. 106-309.000.

Vuht, George: *See—*
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Waddell, James M., to International Business Machines Corporation. Interrupt handling. 3,716,837, Cl. 340-172.500.

Waggoner, Terry B.; and Seyb, Edgar J., Jr., to M & T Chemicals, Inc. Process of metal plating hydrohalogen polymer surface. 3,716,394, Cl. 117-47.00a.

Wakabayashi, Hajime, to Iwatsu Electric Company, Ltd. Brightness compensating system of display apparatus. 3,716,297, Cl. 355-67.000.

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Walsh, George M.; and Chramiec, Mark A., to Raytheon Company. Contour measuring apparatus especially for use in a sea bottom elevation measurement. 3,716,825, Cl. 340-3.00r.

Walukonis, John S., Jr.; and Banks, Donald D., to Anaconda Wire and Cable Company. Latex applicator. 3,716,023, Cl. 118-420.000.

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Warden, Fuller; Lewis, Eugene W.; McNickle, Bernard F.; and Mills, Jack H. Disposable dental appliance and method for preparing and placing silver amalgam fillings. 3,715,806, Cl. 32-60.000.

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Weaver, Max A.; Straley, James M.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Polyester fiber dyed with monoazo compound containing an acylamidotetrahydroquinoline group. 3,716,327, Cl. 8-41.00c.

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Werner, Ardwin. Minimum wire box and device adapters. 3,716,651, Cl. 174-53.000.

Werner, Bernfried M., to Phelan, Louis A. M. Temperature control system for freezers. 3,715,893, Cl. 62-135.000.

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Wiegand, John A., to Maremont Corporation. Shock absorber demonstration stand. 3,715,814, Cl. 35-49.000.

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Willmott, Colin B., to Chamberlain Manufacturing Corporation. Radio controlled system for garage door opener. 3,716,865, Cl. 343-225.000.

Willoughby, Eric O., to University of Adelaide, The. Generation of navigating planes for aircraft landing utilizing parabolic cheese aerial. 3,716,862, Cl. 343-108.000.

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Yannopoulos, Lymperios N.; Jansson, Sven A.; and Gulbransen, Earl. Yttrium-hydrogen isotope compositions for radiochemical reactions. 3,716,491, Cl. 252-301.10r.

Yasso, George H. Dispensing device. 3,716,173, Cl. 222-455.000.

Yerkie, John W., Jr. Ball practice device. 3,716,235, Cl. 273-26.00e.

Yoda, Naoya; Kurihara, Masaru; Dokoshi, Noriaki; Tanaka, Chiaki; and Eguchi, Masaomi, to Toray Industries, Inc. Method for producing a polyamideimide and product of said method. 3,716,519, Cl. 260-47.0cb.

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Young, Gideon Maurice; Silman, Harold; and Hill, Eric John, to Vacu-Blast Limited. Apparatus for correcting misprinted matter on sheet material. 3,715,838, Cl. 51-12.000.

Zanoni, Paul, to Bennett Pump Incorporated, mesne. Compact pump/air separator apparatus. 3,715,863, Cl. 55-204.000.

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Zurbuchen, Louis E.; and Bradam, William R., to National Cash Register Company, The. Reinking mechanism. 3,715,980, Cl. 101-333.000.

Zweegers, Petrus Wilhelmus. Harvesting and ensilage cutting apparatus. 3,715,873, Cl. 56-13.400.

LIST OF PLANT PATENTEES

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PATENTS WERE ISSUED ON THE 13TH DAY OF FEBRUARY, 1973

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Anderson, Eldon L., Jr., to General Electric Co. Luminaire. 226,327, 2–13–73, Cl. D48—31.
Anderson, Robert F. Storage rack for a set of machine tools. 226,298, 2–13–73, Cl. D6—125.
Braun A.G.: *See*—
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Brefka, Paul E.: *See*—
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Burwood Products Co.: *See*—
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Clementi, Leonard C. 226,300.
Clementi, Leonard C., to Cannon Mills Co. Textile fabric. 226,300, 2–13–73, Cl. D6—265.
Conroy, Robert, K. Fleming, B. Hirsch, R. Redel, and J. B. Steinhilber; assignors to Fred Meyer of California. Artificial hearth fire. 226,314, 2–13–73. Cl. D23—94.
Creative Creations, Inc.: *See*—
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Curran, Frank J. Ash tray or similar article. 226,342, 2–13–73, Cl. D85—2.
Dann, Stanley F., to World Commerce. Simulated coil. 226,317, 2–13–73, Cl. D29—11.
Danti, Bernard R., and P. E. Brefka, to Millipore Corp. Viewer for an electrophoresis cassette. 226,340, 2–13–73, Cl. D83—1.
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Hogue, Robert M., and D. N. Emmerich; said Emmerich assignor to said Hogue. Electronic photo flash unit. 226,331, 2–13–73, Cl. D61—1.
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Ibex Precision Products, Inc.: *See*—
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Jordan, Denis J., to National Presto Industries, Inc. Handle for an electric hair styler or the like. 226,343, 2–13–73, Cl. D86—10.
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Reinecke, Jean O., D'Ercoli, and Joss. 226,334.
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Kretz, Edward J. Bottle. 226,303, 2–13–73, Cl. D9—66.
Lab-Line Instruments, Inc.: *See*—
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Levy, Leon M., and Lemanski. 226,335.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,309, 2–13–73, Cl. D22—25.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,310, 2–13–73, Cl. D22—25.
Lemery, Jean-Paul, to Etablissements Carpano et Pons. Fly casting fishing reel. 226,311, 2–13–73, Cl. D22—25.
Levy, Leon M., and H. J. Lemanski, to The Gillette Co. Combined paperweight and penholder. 226,335, 2–13–73, Cl. D74—5.
Longarzo, Roland P., to Ibex Precision Products, Inc. Ball jointed pen holder and the like. 226,336, 2–13–73. Cl. D74—5.
Longarzo, Roland P. Desk set. 226,337, 2–13–73, Cl. D74—5.
Longato, Giuseppe. Table lamp. 226,324, 2–13–73, Cl. D48—20.
Loomis, Judith J. Handbag. 226,344, 2–13–73, Cl. D87—3.
Marier, Gaston. Hood for snowmobile. 226,307, 2–13–73, Cl. D14—24.
Marsh, Robert E. Brine cabinet inner bottom. 226,312, 2–13–73, Cl. D23—3.
Matrangelo, Victor A. Pair of slacks or similar article. 226,295, 2–13–73, Cl. D2—28.
Matsushita Electric Industrial Co., Ltd.: *See*—
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Owens-Illinois, Inc.: *See*—
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Patton, Milburn P., and D. Denski. Cover for trash receptacle. 226,328, 2–13–73, Cl. D49—35.
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Pinti, Ross A. and P. R. 226,308.
Pinti, Ross A. and P. R. Arrow release device. 226,308, 2–13–73, Cl. D22—5.
Poff, Richard B. Lighting fixture. 226,325, 2–13–73, Cl. D48—23.
Quinn, Peter T., to Honeywell Inc. Camera flash attachment. 226,330, 2–13–73, Cl. D61—1.
Redel, Ray: *See*—
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Reinecke, Jean O., G. C. D'Ercoli, and M. S. Joss, to Minnesota Mining and Mfg. Co. Tape dispenser. 226,333, 2–13–73, Cl. D74—1.
Reinecke, Jean O., G. C. D'Ercoli, and M. S. Joss, to Minnesota Mining and Mfg. Co. Tape dispenser. 226,334, 2–13–73, Cl. D74—1.
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Robbins, Daniel H., to Itek Corp. Microfilm reader-printer or similar article. 226,332, 2–13–73, Cl. D61—1.
Roegner, George P., to U.S. Industries, Inc. Portable television receiver or similar article. 226,329, 2–13–73, Cl. D56—4.
Ruskin, Asa P. Can resealer or the like. 226,306, 2–13–73, Cl. D9—282.
Sanders, Ronald D. Golf putter head. 226,319, 2–13–73, Cl. D34—5.
Seiden, Stanford, to Sunair Electronics, Inc. Casing for portable radio transceiver. D226,316, 2–13–73, Cl. D26—14.
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Shames, Sidney J. and H. 226,297.
Shames, Sidney J. and H. Support bracket for a bathroom fixture or the like. 226,296, 2–13–73, Cl. D2—86.
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Wilkes, Lawrence T., to Anchor Hocking Corp. Packaging tray. 226,305, 2–13–73, Cl. D9—188.
Wills, Franklin M., to Burwood Products Co. Combined clock and perpetual calendar. 226,322, 2–13–73, Cl. D42—7.
Wilton Brass Co.: *See*—
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World Commerce: *See*—
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Katayama, Masaharu, Ohta, and Yanagisawa. 226,315.

CLASSIFICATION OF PATENTS

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17 : 226,322
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42 : 226,308
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55 : 226,312
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